MEMORANDUM OF UNDERSTANDING

REGARDING

URBAN WATER CONSERVATION

IN CALIFORNIA

As Amended April 8, 1998

D-046436

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KEY TO NOTATION

The EXHIBITS to the MOU are occasionally altered by the Council as the MOU is updated. In addition, explanatory notes are occasionally inserted to indicate the status of various sections of the EXHIBITS. Changes made to the original EXHIBITS are in the following format:

ADDITIONS:	Additions to the MOU and Exhibits are indicated by an underline.
DELETIONS:	~~*Deletions from the Exhibits have been struck out.*~~
EXPLANATIONS:	*[Explanatory notes are enclosed by brackets.]*

MEMORANDUM OF UNDERSTANDING
REGARDING
URBAN WATER CONSERVATION IN CALIFORNIA

This **Memorandum of Understanding Regarding Urban Water Conservation in California ("MOU")** is made and entered into on the dates set forth below among the undersigned parties ("signatories"). The signatories represent urban water suppliers, public advocacy organizations and other interested groups as defined in Section 1 of this MOU.

AMENDED
September, 1991
February 10, 1993
March 9, 1994
September 30, 1997
April 8, 1998 *

* By-Laws (Exhibit 7) revised 12/9/98

RECITALS

A. The signatories to this MOU recognize that California's economy, quality of life and environment depend in large part upon the water resources of the State. The signatories also recognize the need to provide reliable urban water supplies and to protect the environment. Increasing demands for urban, agricultural and environmental water uses call for conservation and the elimination of waste as important elements in the overall management of water resources. Many organizations and groups in California have an interest in urban water conservation, and this MOU is intended to gain much needed consensus on a complex issue.

B. The urban water conservation practices included in this MOU (referred to as "Best Management Practices" or "BMPs") are intended to reduce long-term urban demands from what they would have been without implementation of these practices and are in addition to programs which may be instituted during occasional water supply shortages.

C. The combination of BMPs and urban growth, unless properly accounted for in water management planning, could make reductions in urban demands during short-term emergencies such as droughts or earthquakes more difficult to achieve. However, notwithstanding such difficulties, the signatory water suppliers will carry out the urban water conservation BMP process as described in this MOU.

D. The signatories recognize that means other than urban water conservation may be needed to provide long-term reliability for urban water suppliers and long-term protection of the environment. However, the signatories may have differing views on what additional measures might be appropriate to provide for these needs. Accordingly, this MOU is not intended to address these issues.

E. A major benefit of this MOU is to conserve water which could be used for the protection of streams, wetlands and estuaries and/or urban water supply reliability. This MOU leaves to other forums the issue of how conserved water will be used.

F. It is the intent of this MOU that individual signatory water suppliers (1) develop comprehensive conservation BMP programs using sound economic criteria and (2) consider water conservation on an equal basis with other water management options.

G. It is recognized that present urban water use throughout the State varies according to many factors including, but not limited to, climate, types of housing and landscaping, amounts and kinds of commercial, industrial and recreational development, and the extent to which conservation measures have already been implemented. It is further recognized that many of the BMPs identified in Exhibit 1 to this MOU have already been implemented in some areas and that even with broader employment of BMPs, future urban water use will continue to vary from area to area. Therefore, this MOU is not intended to establish uniform per capita water use allotments throughout the urban areas of the State. This MOU is also not intended to limit the amount or types of conservation a water supplier can pursue or to limit a water supplier's more rapid implementation of BMPs.

H. It is recognized that projections of future water demand should include estimates of anticipated demand reductions due to changes in the real price of water.

TERMS

SECTION 1. DEFINITIONS

For purposes of this MOU, the following definitions apply:

1.1 **Best Management Practices.** A Best Management Practice ("BMP") means a policy, program, practice, rule, regulation or ordinance or the use of devices, equipment or facilities which meets either of the following criteria:

(a) An established and generally accepted practice among water suppliers that results in more efficient use or conservation of water;

(b) A practice for which sufficient data are available from existing water conservation projects to indicate that significant conservation or conservation related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water suppliers to carry out.

Although the term "Best Management Practices" has been used in various statutes and regulations, the definitions and interpretations of that term in those statutes and regulations do not apply to this MOU. The term "Best Management Practices" or "BMPs" has an independent and special meaning in this MOU and is to be applied for purposes of this MOU only as defined above.

1.2 **Implementation.** "Implementation" means achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in the descriptions of the various BMPs and to satisfy the commitment by the signatories to use good faith efforts to optimize savings from implementing BMPs as described in Section 4.4 of this MOU. Section B of Exhibit 1 to this MOU establishes the schedule for initial implementation of BMPs.

1.3 **Signatory Groups.** For purposes of this MOU, signatories will be divided into three groups as follows:

(a) Group 1 will consist of water suppliers. A "water supplier" is defined as any entity, including a city, which delivers or supplies water for urban use at the wholesale or retail level.

(b) Group 2 will consist of public advocacy organizations. A "public advocacy organization" is defined as a non profit organization:

(i) whose primary function is not the representation of trade, industrial, or utility entities, and

(ii) whose prime mission is the protection of the environment or who has a clear interest in advancing the BMP process.

(c) Group 3 will consist of other interested groups. "Other interested groups" is defined as any other group which does not fall into one of the two groups above.

1.4 **California Urban Water Conservation Council.** The California Urban Water Conservation Council or "Council" will have responsibility for monitoring the implementation of this MOU and will be comprised of signatories to this MOU grouped according to the definitions in Section 1.3 above. The duties of the Council are set forth in Section 6 and in Exhibit 2 to this MOU.

SECTION 2. PURPOSES

2.1 **This MOU has two primary purposes:**

(1) to expedite implementation of reasonable water conservation measures in urban areas; and

(2) pursuant to Section 5 of this MOU, to establish assumptions for use in calculating estimates of reliable future water conservation savings resulting from proven and reasonable conservation measures. Estimates of reliable savings are the water conservation savings which can be achieved with a high degree of confidence in a given service area. The signatories have agreed upon the initial assumptions to be used in calculating estimates of reliable savings. These assumptions are included in Exhibit 1 to this MOU. It is probable that average savings achieved by water suppliers will exceed the estimates of reliable savings.

SECTION 3. LIMITS TO APPLICABILITY OF MOU

3.1 **Relationship Between Water Suppliers.** No rights, obligations or authorities between wholesale suppliers, retail agencies, cities or other water suppliers are created or expanded by this MOU. Moreover, wholesale water suppliers are not obligated to implement BMPs at the retail customer level except within their own retail service area, if any.

3.2 **Agriculture.** This MOU is intended to apply only to the delivery of water for domestic, municipal and industrial uses. This MOU is not intended to apply directly or indirectly to the use of water for irrigated agriculture.

3.3 **Reclamation.** The signatory water suppliers support the reclamation and reuse of wastewater wherever technically and economically reasonable and not environmentally or socially unacceptable, and agree to prepare feasibility studies on water reclamation for their respective service areas. However, this MOU does not apply to that aspect of water management, except where the use of reclaimed water may otherwise qualify as a BMP as defined above.

3.4 **Land Use Planning.** This MOU does not deal with the question of growth management. However, each signatory water supplier will inform all relevant land planning agencies at least annually of the impacts that planning decisions involving projected growth would have upon the reliability of its water supplies for the water supplier's service area and other areas being considered for annexation.

3.5 **Use of Conserved Water.** A major benefit of this MOU is to conserve water which could be used for the protection of streams, wetlands and estuaries and/or urban water supply reliability. This MOU leaves to other forums the issue of how conserved water will be used.

SECTION 4. IMPLEMENTATION OF BEST MANAGEMENT PRACTICES

4.1 **The Best Management Practices List, Schedule of Implementation and Assumptions.** Exhibit 1 to this MOU contains:

(a) In Section A: A list identifying those practices which the signatories believe presently meet the definition of a BMP as set forth in Section 1.1 of this MOU.

(b) In Section B: A schedule for implementing the BMPs to be followed by signatory water suppliers unless exempted under Section 4.5 of this MOU or an alternative schedule is prepared pursuant to Section 4.6 of this MOU.

(c) In Section C: Coverage requirements for implementing BMPs. Coverage requirements are the expected level of implementation necessary to achieve full implementation of BMPs. Coverage requirements may be expressed either in terms of activity levels by water suppliers or as water savings achieved.

(d) In Section D: Reporting Requirements for Documenting BMP Implementation. These requirements vary by BMP, are considered the minimum record keeping and reporting requirements for water suppliers to document BMP implementation levels, and will provide the basic data used evaluate BMP implementation progress by water suppliers.

(e) In Section E: Criteria to determine BMP implementation status of water suppliers. These criteria will be used to evaluate BMP implementation progress. Evaluation criteria vary by BMP, and are derived from the implementation guidelines and schedules presented in Sections A, B, and C.

(f) In Section F: Assumptions for use in developing estimates of reliable savings from the implementation of BMPs. Estimates of reliable savings are the water conservation savings which can be achieved with a high degree of confidence in a given service area. The estimate of reliable savings for each BMP depends upon the nature of the BMP and upon the amount of data available to evaluate potential savings. For some BMPs (e.g., public information) estimates of reliable savings may never be generated. For others, additional data may lead to significant changes in the estimate of reliable savings. It is probable that average savings achieved by water suppliers will exceed the estimates of reliable savings.

(g) In Section G: A list of "Potential Best Management Practices" ("PBMPs"). PBMPs are possible conservation practices which have not been promoted to the BMP list.

4.2 **Initial BMPs, PBMPs, Schedules, and Estimates of Reliable Savings.** The initial position of conservation practices on the BMP and PBMP lists, the initial schedule of implementation and study for the BMP list, the initial schedule of study for the PBMP list, and the initial estimates of reliable savings represent compromises by the signatories to move the process forward both for purposes of the present Bay/Delta proceedings as defined in Section 5 and to promote water conservation generally. The signatories agree that as more and better data are collected in the future, the lists, the schedules, and the estimates of reliable savings will be refined and revised based upon the most objective criteria available. However, the signatories agree that the measures included as initial BMPs in Section A of Exhibit 1 are economically justified on a statewide basis.

4.3 **Future Revision of BMPs, PBMPs, Schedules, and Estimates of Reliable Savings.** After the beginning of the initial term of the MOU as provided in Section 7.1, the California Urban Water Conservation Council ("Council") will, pursuant to Section 6 of this MOU and Exhibit 2, alter the composition of the BMP and PBMP lists, redefine individual BMPs, alter the schedules of implementation, and update the assumptions of reliable savings as more data becomes available. This dynamic BMP assessment process includes the following specific commitments:

(a) The assumptions of reliable savings will be updated at least every 3 years.

(b) The economic reasonableness of a BMP or PBMP will be assessed by the Council using the economic principles in Sections 3 and 4 of Exhibit 3.

(c) A BMP will be removed from the BMP list if, after review of data developed during implementation, the Council determines that the BMP cannot be made economically reasonable or determines that the BMP otherwise fails to conform to the definition of BMPs in Section 1.1.

(d) A PBMP will be moved to the BMP list and assigned a schedule of implementation if, after review of data developed during research, and/or demonstration projects, the Council determines that the PBMP is economically reasonable and otherwise conforms to the definition of BMPs in Section 1.1.

[Note: In 1997, the CUWCC substantially revised the BMP list, definitions, and schedules contained in Exhibit 1. These revisions were adopted by the CUWCC September 30, 1997.]

4.4 **Good Faith Effort** While specific BMPs and results may differ because of varying local conditions among the areas served by the signatory water suppliers, a good faith effort to implement BMPs will be required of all signatory water suppliers. The following are included within the meaning of "good faith effort to implement BMPs":

(a) The proactive use by a signatory water supplier of legal authorities and administrative prerogatives available to the water supplier as necessary and reasonable for the implementation of BMPs.

(b) Where implementation of a particular BMP is not within the legal authority of a signatory water supplier, encouraging timely implementation of the BMP by other entities that have the legal authority to carry out the BMP within that water supplier's service area pursuant to existing legal authority. This encouragement may include, but is not limited to, financial incentives as appropriate.

(c) Cooperating with and encouraging cooperation between other water suppliers and other relevant entities whenever possible and within existing legal authority to promote the implementation of BMPS.

(d) Optimizing savings from implementing BMPs.

(e) For each signatory water supplier and all signatory public advocacy organizations, encouraging the removal of institutional barriers to the implementation of BMPs within that water supplier's service area. Examples of good faith efforts to remove institutional barriers include formal presentations and/or written requests to entities requesting approval of, or amendment to, local ordinances, administrative policies or legislation which will promote BMP implementation.

4.5 **Exemptions.** A signatory water supplier will be exempt from the implementation of specific BMPs for as long as the supplier substantiates each reporting period that based upon then prevailing local conditions, one or more of the following findings applies:

(a) A full cost-benefit analysis, performed in accordance with the principles set forth in Exhibit 3, demonstrates that either the program (i) would not be cost-effective overall when total program benefits and costs are considered; OR (ii) would not be cost-effective to the individual water supplier even after the water supplier has made a good faith effort to share costs with other program beneficiaries.

(b) Adequate funds are not and cannot reasonably be made available from sources accessible to the water supplier including funds from other entities. However, this exemption cannot be used if a new, less cost-effective water management option would be implemented instead of the BMP for which the water supplier is seeking this exemption.

(c) Implementation of the BMP is (i) not within the legal authority of the water supplier; and (ii) the water supplier has made a good faith effort to work with other entities that have the legal authority to carry out the BMP; and (iii) the water supplier has made a good faith effort to work with other relevant entities to encourage the removal of institutional barriers to the implementation of BMPs within its service area.

Signatory water suppliers shall submit exemptions to the Council within two months following the start of the reporting period for which the exemptions are being claimed.

4.6 **Schedule of Implementation.** The schedule of implementation for BMPs is set forth in Section B of Exhibit 1 to this MOU. However, it is recognized by the signatories that deviations from this schedule by water suppliers may be necessary. Therefore, a water supplier may modify, to the minimum extent necessary, the schedule for implementation of BMPs if the water supplier substantiates one or more of the following findings:

(a) That after a good faith effort to implement the BMP within the time prescribed, implementation is not feasible pursuant to the schedule. However, implementation of this BMP is still required as soon as feasible within the initial term of this MOU as defined in Section 7.1.

a) That implementation of one or more BMPs prior to other BMPs will have a more positive effect on conservation or water supplies than will adherence to the schedule.

b) That implementation of one or more Potential BMPs or other conservation measures prior to one or more BMPs will have a more positive effect on conservation or water supplies than will adherence to the schedule.

SECTION 5. BAY/DELTA PROCEEDINGS

[Note: The following section was adopted with the initial MOU and has been retained in subsequent revisions. The "present proceedings" refers to the State Water Resources Control Board water rights process then underway to implement new Bay-Delta flow and export standards. As of the date this note was adopted (April 8, 1998), proceedings to implement updated standards are still underway. Therefore, the joint recommendations of the signatories to the SWRCB contained in this letter continue to apply.]

5.1 **Use of MOU for Bay/Delta Proceedings.** The BMPs, the estimates of reliable savings and the processes established by this MOU are agreed to by the signatories for purposes of the present proceedings on the San Francisco Bay/Sacramento-San Joaquin Delta Estuary ("Bay/Delta") and in order to move the water conservation process forward. "Present Bay/Delta proceedings" is intended to mean those Bay/Delta proceedings presently underway and those conducted until a final water rights decision is reached by the State Water Resources Control Board ("State Board"). The willingness of the signatories to enter into this MOU for purposes of the present Bay/Delta proceedings in no way limits the signatories' ability to propose different conservation practices, different estimates of savings, or different processes in a forum other than the present Bay/Delta proceedings, or for non-urban water suppliers or for other water management issues. By signing this MOU, public advocacy organization signatories are not agreeing to use the initial assumptions of reliable conservation savings in proceedings other than the present Bay/Delta proceedings. The signatories may present other assumptions of reliable conservation savings for non-signatory water suppliers in the present Bay/Delta proceedings, provided that such assumptions could not have adverse impacts upon the water supplies of any signatory water supplier. Furthermore, the signatories retain the right to advocate any particular level of protection for the Bay/Delta Estuary, including levels of freshwater flows, and do not necessarily agree on population projections for California. This MOU is not intended to address any authority or obligation of the State Board to establish freshwater flow protections or set water quality objectives for the Estuary, or to address any authority of the Environmental Protection Agency.

5.2 **Recommendations for Bay/Delta Proceedings.** The signatories will make the following recommendations to the State Board in conjunction with the present Bay/Delta proceedings and to the EPA to the extent the EPA concerns itself with the proceedings:

(a) That for purposes of the present Bay/Delta proceedings, implementation of the BMP process set forth in this MOU represents a sufficient long-term water conservation program by the signatory water suppliers, recognizing that additional programs may be required during occasional water supply shortages;

(b) That for purposes of the present Bay/Delta proceedings only, the State Board and EPA should base their estimates of future urban water conservation savings on the implementation of all of the BMPs included in Section A of Exhibit 1 to this MOU for the entire service area of the signatory water suppliers and only on those BMPs, except for (I) the conservation potential for water supplied by urban agencies for agricultural purposes, or (ii) in cases where higher levels of conservation have been mandated;

(c) That for the purposes of the present Bay/Delta proceedings, the State Board and EPA should make their estimates of future urban water conservation savings by employing the reliable savings assumptions associated with those BMPs set forth in Section C of Exhibit 1 to this MOU;

(d) That the State Board should include a policy statement in the water rights phase of the Bay/Delta proceedings supporting the BMP process described in this MOU and that the BMP process should be considered in any documents prepared by the State Board pursuant to the California Environmental Quality Act as part of the present Bay/Delta proceedings.

5.3 **Letter to State Board.** Within 30 days of signing this MOU, each signatory will jointly or individually convey the principles set forth in Sections 5.1 and 5.2 above by sending a letter to the State Board, copied to the EPA, in the form attached to this MOU as Exhibit 4.

5.4 **Withdrawal from MOU.** If during the present Bay/Delta proceedings, the State Board or EPA uses future urban water conservation savings that are inconsistent with the use of BMPs as provided in this MOU, any signatory shall have the right to withdraw from the MOU by providing written notice to the Council as described in Section 7.4(a)(I) below.

SECTION 6. CALIFORNIA URBAN WATER CONSERVATION COUNCIL

6.1 **Organization.** The California Urban Water Conservation Council ("Council") will be comprised of all signatories to this MOU grouped according to the definition in Section 1. The signatories agree to the necessary organization and duties of the Council as specified in Exhibit 2 to this MOU. Within 30 days of the effective date of this MOU, the Council will hold its first meeting.

6.2 **BMP Implementation Reports.** The signatory water suppliers will submit standardized reports every other year to the Council providing sufficient information to inform the Council on the progress being made towards implementing the BMP process. The Council will make annual reports to the State Board. An outline for the Council's annual report to the State Board is attached as Exhibit 5 to this MOU.

SECTION 7. GENERAL PROVISIONS

7.1 **Initial Term of MOU.** The initial term of this MOU shall be for a period of 10 years. This initial term shall commence on September 1, 1991.

7.2 **Signatories.** Signatories shall consist of three groups: water suppliers, public advocacy organizations and other interested groups, arranged according to the definition in Section 1.3. Such arrangement will be made by a Council membership committee comprised of three representatives from the water suppliers' group and three representatives from the public advocacy organizations' group.

7.3 **Renewal of MOU.** The MOU shall be automatically renewed after the initial term of 10 years on an annual basis as to all signatories unless a signatory withdraws as described below in Section 7.4.

7.4 **Withdrawal from MOU.** Signatories to the MOU may withdraw from the MOU in three separate ways as described in sections (a), (b) and 8 below.

(a) **Withdrawal prior to expiration of initial term.** Before the expiration of the initial term of 10 years, a signatory may withdraw by providing written notice to the Council declaring its intent to withdraw. This written notice must include a substantiated finding that one of the two provisions (I) or (ii) below applies:

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(i) During the present Bay/Delta proceedings, the State Board or EPA used future urban water conservation savings that are inconsistent with the use of BMPs as provided in this MOU; OR

(ii) After a period of 5 years from the commencement of the initial term of the MOU:

(1) Specific signatory water suppliers representing more than 10 percent of the population included within the combined service areas of the signatory water suppliers have failed to act in good faith pursuant to Section 4.4 of the MOU; and

(2) The signatory wishing to withdraw has attached findings to its past two annual reports to the Council beginning no earlier than the fourth annual report identifying these same signatory water suppliers and giving evidence based upon the information required to be submitted in the annual reports to the Council to support the allegations of failure to act in good faith; and

(3) The State Board has failed to require conservation efforts by the specific water suppliers adequate to satisfy the requirements of this MOU; and

(4) Discussions between the signatory wishing to withdraw and the specific signatories named have failed to satisfy the objections of the signatory wishing to withdraw.

After a signatory declares an intent to withdraw under Section 7.4(a), the MOU shall remain in effect as to that signatory for 180 days.

(b) **Withdrawal after expiration of initial term.** After the initial term of 10 years, any signatory may declare its intent to withdraw from the MOU unconditionally by providing written notice to the Council. After a signatory has declared its intent to withdraw as provided in this section, the MOU will remain in effect as to that signatory for 180 days.

(c) **Immediate withdrawal.** Any signatory who does not sign a modification to the MOU requiring a 2/3 vote as described in Exhibit 2 of this MOU may withdraw from the MOU by providing written notice to the Council. The withdrawing signatory's duties under this MOU will be terminated effective immediately upon providing such written notice.

If a signatory withdraws from the MOU under any of the above methods, the MOU shall remain in effect as to all other signatories.

7.5 **Additional Parties.** Additional parties may sign the MOU after September 1, 1991 by providing written notice to and upon approval by the Council. Additional parties will be assigned by the Council to one of the three signatory groups defined in Section 1.3 before entry into the Council. All additional signatory water suppliers shall be subject to the schedule of implementation provided in Exhibit 1.

7.6 **Legal Authority.** Nothing in this MOU is intended to give any signatory, agency, entity or organization expansion of any existing authority. No organization formed pursuant to this MOU has authority beyond that specified in this MOU.

7.7 **Non-Contractual Agreement.** This MOU is intended to embody general principles agreed upon between and among the signatories and is not intended to create contractual relationships, rights, obligations, duties or remedies in a court of law between or among the signatories.

7.8 **Modifications.** The signatories agree that this writing constitutes the entire understanding between and among the signatories. The general manager, chief executive officer or executive director of each signatory or their designee shall have the authority to vote on any modifications to this MOU and its exhibits. Any modifications to the MOU itself and to its exhibits shall be made by the Council as described in Exhibit 2.

EXHIBIT 1. BMP DEFINITIONS, SCHEDULES, AND REQUIREMENTS

This Exhibit contains Best Management Practices (BMPs) that signatory water suppliers commit to implementing. Suppliers' water needs estimates will be adjusted to reflect estimates of reliable savings from this category of BMPs. For some BMPs, no estimate of savings is made.

It is recognized by all parties that a single implementation method for a BMP would not be appropriate for all water suppliers. In fact, it is likely that as the process moves forward, water suppliers will find new implementation methods even more effective than those described. Any implementation method used should be at least as effective as the methods described below.

Best Management Practices will be implemented by signatory water suppliers according to the schedule set forth in Section B of each BMP's definition. These schedules set forth the latest dates by which implemention of BMPs will be underway. It is recognized that some signatories are already implementing some BMPs, and that these schedules do not prohibit signatories from implementing BMPs sooner than required.

"Implementation" means achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in Section A of each BMP's definition, and to satisfy the commitment by the signatories to use good faith efforts to optimize savings from implementing BMPs as described in Section 4.4 of the MOU. BMPs will be implemented at a level of effort projected to achieve at least the coverages specified in Section C of each BMP's definition, and in accordance with each BMP's implementation schedule.

Section D of each BMP definition contains the minimum record keeping and reporting requirements for agencies to document BMP implementation levels and efforts, and will be used to guide CUWCC development of BMP implementation report forms and database.

The evaluation criteria presented in Section E of each BMP definition shall be used to evaluate compliance with the implementation definitions, schedules, and coverage requirements specified in Sections A, B, and C of each BMP definition.

Section F of each BMP definition contains the assumptions of reliable savings to be used in accordance with Sections 5.1 and 5.2 of the MOU.

1. WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL CUSTOMERS

A. Implementation

Implementation shall consist of at least the following actions:

a) Develop and implement a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers.

b) Directly contact via letter or telephone not less than 20% of single-family residential customers and 20% of multi-family residential customers each reporting period.

c) Surveys shall include indoor and outdoor components, and at minimum shall have the following elements:

Indoor

i) Check for leaks, including toilets, faucets, and meter check

ii) Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, as necessary

iii) Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary

Outdoor

iv) Check irrigation system and timers

v) Review or develop customer irrigation schedule

Recommended but not required

vi) Measure currently landscaped area

vii)Measure total irrigable area

d) Provide customer with evaluation results and water saving recommendations; leave information packet with customer.

e) Track surveys offered, surveys completed, survey results, and survey costs.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the year following the year the agency signed or became subject to the MOU.

c) Agencies shall develop and implement a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.

d) The coverage requirement for this BMP, as specified in Section C of this Exhibit, shall be realized within 10 years of the date implementation was to commence.

C. Coverage Requirements

a) Not less than 15% of single-family residential accounts to receive water use surveys within 10 years of the date implementation was to commence.

b) Not less than 15% of multi-family residential units to receive water use surveys within 10 years of the date implementation was to commence.

D. Requirements for Documenting BMP Implementation

a) Number of single-family residential accounts in service area.

b) Number of multi-family residential accounts in service area.

c) Number of single-family residential surveys offered during reporting period.

d) Number of single-family residential surveys completed during reporting period.

e) Number of multi-family residential surveys offered during reporting period.

f) Number of multi-family residential surveys completed during reporting period.

E. Criteria to Determine BMP Implementation Status

a) Agency has developed and implemented a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.

b) Agency has directly contacted not less than 20% of single-family residential accounts and 20% of multi-family residential units during period being reported.

c) Agency is on schedule to complete surveys for 15% of single-family residential accounts and 15% of multi-family units within 10 years of the date implementation was to commence. Agencies will receive credit against the coverage requirement for previously completed residential water use surveys according to the following schedule:*

	% Credit
Before 1990	0.0%
1990	12.5%
1991	25.0%
1992	37.5%
1993	50.0%
1994	62.5%
1995	75.0%
1996	87.5%
1997	100.0%

d) Agencies will be considered on track if the percent of single-family accounts and the percent of multi-family accounts receiving water use surveys equals or exceeds the following: 1.5% by end of first reporting period following date implementation to commence; 3.6% by end of second reporting period; 6.3% by end of third reporting period; 9.6% by end of fourth reporting period; and 13.5% by end of fifth reporting period.

* In its study "What is the Reliable Yield from Residential Home Water Survey Programs: The Experience of LADWP" (AWWA Conf. Proceedings, 1995), A & N Technical Services, Inc., found that the average level of savings from home water surveys decreased over time, reaching about 50% of initial yield by the fourth year following the survey, on average. The above decay schedule used for crediting past surveys utilizes these findings to recognize and account for the limited persistence of water savings over time from home water use surveys.

F. Water Savings Assumptions

	Pre-1980 Construction	Post-1980 Construction
Low-flow showerhead retrofit	7.2 gcd	2.9 gcd
Toilet retrofit (five year life)	1.3 gcd	0.0 gcd
Leak repair	0.5 gcd	0.5 gcd
Landscape survey (outdoor use reduction)	10%	10%

2. RESIDENTIAL PLUMBING RETROFIT

A. Implementation

Implementation shall consist of at least the following actions:

a) Identify single-family and multi-family residences constructed prior to 1992. Develop a targeting and marketing strategy to distribute or directly install high-quality, low-flow showerheads (rated 2.5 gpm or less), toilet displacement devices (as needed), toilet flappers (as needed) and faucet aerators (rated 2.2 gpm or less) as practical to residences requiring them.

b) Maintain distribution and/or direct installation programs so that devices are distributed to not less than 10% of single-family connections and multi-family units each reporting period, or require through enforceable ordinance the replacement of high-flow showerheads and other water using fixtures with their low-flow counterparts, until it can be demonstrated in accordance with Section E of this Exhibit that 75% of single-family residences and 75% of multi-family units are fitted with high-quality, low-flow showerheads.

c) Track the type and number of retrofits completed, devices distributed, and program costs.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the year following the year the agency signed or became subject to the MOU.

c) Agencies shall develop and implement a strategy targeting the distribution and/or installation of high-quality, low-flow plumbing devices to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.

d) An agency may elect to discontinue its device distribution programs without filing a formal budget or cost-effectiveness exemption when it can demonstrate that 75% of its single-family residences and 75% of its multi-family units constructed prior to 1992 are fitted with high-quality, low-flow showerheads.

C. Coverage Requirements

a) Plumbing device distribution and installation programs to be maintained at a level sufficient to distribute high-quality, low-flow showerheads to not less than 10% of single-family residences and 10% of multi-family units constructed prior to 1992 each reporting period; or the enactment of an enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts.

b) Plumbing device distribution and installation programs to be operated until it can be demonstrated in accordance with Section E of this Exhibit that 75% of single-family residences and 75% of multi-family units are fitted with high-quality, low-flow showerheads.

D. Requirements for Documenting BMP Implementation

a) The target population of pre-1992 single-family residences and multi-family units to be provided showerheads and other water saving devices.

b) The number of showerhead retrofit kits distributed during previous reporting period.

c) The number of device retrofits completed during the previous reporting period.

d) The estimated percentage of pre-1992 single-family residences and multi-family units in service area fitted with low-flow showerheads.

E. Criteria to Determine BMP Implementation Status

a) Agency has developed and implemented a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.

b) Agency has tracked the type and number of retrofits completed, devices distributed, and program costs.

c) Agency EITHER

i) has distributed or directly installed high-quality, low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family residences and 10% of multi-family units constructed prior to 1992 during the reporting period; and/or has enacted an ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts.

OR

ii) can demonstrate through customer surveys with 95% statistical confidence and a ±10% error that 75% of single-family residences and 75% of multi-family units constructed prior to 1992 are fitted with low-flow showerheads.

F. Water Savings Assumptions

	Pre-1980 Construction	Post-1980 Construction
Low-flow showerhead retrofit	7.2 gcd	2.9 gcd
Toilet retrofit (five year life)	1.3 gcd	0.0 gcd

3. SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR

A. Implementation

Implementation shall consist of at least the following actions:

a) Annually complete a prescreening system audit to determine the need for a full-scale system audit. The prescreening system audit shall calculated as follows:

i) Determine metered sales;

ii) Determine other system verifiable uses;

iii) Determine total supply into the system;

iv) Divide metered sales plus other verifiable uses by total supply into the system. If this quantity is less than 0.9, a full-scale system audit is indicated.

b) When indicated, agencies shall complete water audits of their distribution systems using methodology consistent with that described in AWWA's "Water Audit and Leak Detection Guidebook."

c) Agencies shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter; perform distribution system leak detection when warranted and cost-effective; and repair leaks when found.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

a) Agency shall maintain an active distribution system auditing program.

b) Agency shall repair identified leaks whenever cost-effective.

D. Requirements for Documenting BMP Implementation

a) Prescreening audit results and supporting documentation;

b) Maintain in-house records of audit results or the completed AWWA Audit Worksheets for each completed audit period.

E. Criteria to Determine BMP Implementation Status

a) Agency has annually completed a pre-screening distribution system audit.

b) Agency has conducted a full system audit consistent with methods described by AWWA's "Manual of Water Supply Practices, Water Audits and Leak Detection" whenever indicated by a pre-screening audit.

F. Water Savings Assumptions

Unaccounted water losses assumed to be no more than 10% of total water into the water supplier's system.

4. METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

A. Implementation

Implementation shall consist of at least the following actions:

a) Requiring meters for all new connections and billing by volume of use

b) Establishing a program for retrofitting existing unmetered connections and billing by volume of use.

c) Identifying intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

c) A plan to retrofit and bill by volume of use existing unmetered connections to be completed by end of the first reporting period following the date implementation was to commence.

d) A feasibility study examining incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters to be completed by end of the first reporting period following the date implementation was to commence.

C. Coverage Requirements

100% of existing unmetered accounts to be metered and billed by volume of use within 10 years of date implementation was to commence.

D. Requirements for Documenting BMP Implementation

a) Confirmation that all new connections are metered and are being billed by volume of use.

b) Number of unmetered accounts in the service area. For the purposes of evaluation, this shall be defined as the baseline meter retrofit target, and shall be used to calculate the agencies minimum annual retrofit requirement.

c) Number of unmetered connections retrofitted during the reporting period.

d) Number of CII accounts with mixed-use meters.

e) Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.

E. Criteria to Determine BMP Implementation Status

a) Agency with existing unmetered connections has completed a meter retrofit plan by end of first reporting period following the date implementation was to commence.

b) Agency has completed a feasibility study examining incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters by end of first reporting period following the date implementation was to commence.

c) Agency with existing unmetered connections is on track to meter these connections within 10 years of the date implementation was to commence. An agency will be considered on track if the percent of unmetered accounts retrofitted with meters equals or exceeds the following: 10% by end of first reporting period following date implementation to commence; 24% by end of second reporting period; 42% by end of third reporting period; 64% by end of fourth reporting period; and 90% by end of fifth reporting period.

F. Water Savings Assumptions

Assume meter retrofits will result in a 20% reduction in demand by retrofitted accounts.

5. LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES

A. Implementation

Implementation shall consist of at least the following actions:

Customer Support, Education and Assistance

a) Agencies shall provide non-residential customers with support and incentives to improve their landscape water use efficiency. This support shall include, but not be limited to, the following:

Accounts with Dedicated Irrigation Meters

a) Identify accounts with dedicated irrigation meters and assign ETo-based water use budgets equal to no more than 100% of reference evapotranspiration per square foot of landscape area in accordance with the schedule given in Section B of this Exhibit.

b) Provide notices each billing cycle to accounts with water use budgets showing the relationship between the budget and actual consumption in accordance with the schedule given in Section B of this Exhibit; agencies may choose not to notify customers whose use is less than their water use budget.

Commercial/Industrial/Institutional Accounts with Mixed-Use Meters or Not Metered

a) Develop and implement a strategy targeting and marketing large landscape water use surveys to commercial/industrial/institutional (CII) accounts with mixed-use meters. Each reporting period, directly contact via letter or telephone not less than 20% of CII accounts with mixed-use meters and offer water use surveys. (Note: CII surveys that include both indoor and outdoor components can be credited against coverage requirements for both BMP 5 and BMP 9.)

b) Unmetered service areas will actively market landscape surveys to existing accounts with large landscapes, or accounts with landscapes which have been determined by the purveyor not to be water efficient.

c) Offer the following measures when cost-effective:

i) Landscape water use analysis/surveys

ii) Voluntary water use budgets

iii) Installation of dedicated landscape meters

iv) Training (multi-lingual where appropriate) in landscape maintenance, irrigation system maintenance, and irrigation system design.

v) Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water efficient irrigation systems.

vi) Follow-up water use analyses/surveys consisting of a letter, phone call, or site visit where appropriate

d) Survey elements will include: measurement of landscape area; measurement of total irrigable area; irrigation system check, and distribution uniformity analysis; review or develop irrigation schedules, as appropriate; provision of a customer survey report and information packet.

e) Track survey offers, acceptance, findings, devices installed, savings potential, and survey cost.

New or Change of Service Accounts

Provide information on climate-appropriate landscape design, efficient irrigation equipment/management to new customers and change-of-service customer accounts.

Recommended

a) Install climate appropriate water efficient landscaping at water agency facilities, and dual metering where appropriate.

b) Provide customer notices prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary. Provide customer notices at the end of the irrigation season advising them to adjust their irrigation system timers and irrigation schedules.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

c) Develop ETo-based water use budgets for all accounts with dedicated irrigation meters by the end of the second reporting period from the date implementation was to commence.

d) Develop and implement a plan to target and market landscape water use surveys to CII accounts with mixed-use meters by the end of the first reporting period from the date implementation was to commence.

e) Develop and implement a customer incentive program by the end of the first reporting period from the date implementation was to commence.

C. Coverage Requirements

a) ETo-based water use budgets developed for 90% of CII accounts with dedicated irrigation meters by the end of the second reporting period from the date implementation was to commence.

b) Not less than 20% of CII accounts with mixed-use meters contacted and offered landscape water use surveys each reporting period.

c) Irrigation water use surveys completed for not less than 15% of CII accounts with mixed-use meters within 10 years of the date implementation was to commence. (Note: CII surveys that include both indoor and outdoor components can be credited against coverage requirements for both BMP 5 and BMP 9.)

D. Requirements for Documenting BMP Implementation

Dedicated Landscape Irrigation Accounts

Agencies shall preserve water use records and budgets for customers with dedicated landscape irrigation accounts for a period of not less than two reporting periods. This information may be used by the CUWCC to verify the agency's reporting on this BMP .

a) Number of dedicated irrigation meter accounts.

b) Number of dedicated irrigation meter accounts with water budgets.

c) Aggregate water use for dedicated landscape accounts with budgets.

d) Aggregate budgeted water use for dedicated landscape accounts with budgets.

Mixed Use Accounts

a) Number of mixed use accounts

b) Number, type, and dollar value of incentives, rebates, and no, or low interest loans offered to, and received by, customers.

c) Number of surveys offered

d) Number of surveys accepted

e) Estimated annual water savings by customers receiving surveys and implementing recommendations.

E. Criteria to Determine BMP Implementation Status

a) Agency has developed water use budgets for 90% of accounts with dedicated irrigation meters by end of second reporting period from date implementation was to commence.

b) Agency has implemented irrigation water use survey program for CII accounts with mixed-use meters, and directly contacts and offers surveys to not less than 20% of accounts each reporting period. (A program to retrofit mixed-use accounts with dedicated landscape meters and assigning water use budgets, or a program giving mixed-use accounts ETo-based budgets for irrigation uses satisfies this criterion.)

c) Agency is on track to provide water use surveys to not less than 15% of CII accounts with mixed-use meters within 10 years of the date implementation was to commence. Agency may credit 100% of the number of landscape water use surveys for CII accounts with mixed-use meters completed prior to July 1, 1996, that have received a follow-up inspection against the coverage requirement; and 50% of surveys that have not received follow-up inspections. Agency may credit 100% of the number of landscape water use surveys completed for CII accounts with mixed-use meters after July 1, 1996 against the coverage requirement. (A program to retrofit mixed-use accounts with dedicated landscape accounts, or a program giving mixed-use accounts ETo-based budgets for irrigation uses satisfy this criterion.)

d) An agency will be considered on track if the percent of CII accounts with mixed-use meters receiving a landscape water use survey equals or exceeds the following: 1.5% by end of first reporting period following date implementation to commence; 3.6% by end of second reporting period; 6.3% by end of third reporting period; 9.6% by end of fourth reporting period; and 13.5% by end of fifth reporting period. (A program to retrofit mixed-use accounts with dedicated landscape accounts, or a program giving mixed-use accounts ETo-based budgets for irrigation uses satisfy this criterion.)

e) Agency has implemented and is maintaining customer incentive program(s) for irrigation equipment retrofits.

F. Water Savings Assumptions

Assume landscape surveys will result in a 15% reduction in demand for landscape uses by surveyed accounts.

6. HIGH-EFFICIENCY WASHING MACHINE REBATE PRGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

CUWCC Actions and Responsibilities

a) Within 6 months from the adoption of this BMP, the Council will develop interim estimates of reliable water savings attributable to the use of high-efficiency washing machines based on the results of the THELMA Study and other available data. Water purveyors may defer implementing this BMP until the Council has adopted these interim estimates. [NOTE: INTERIM ESTIMATE OF RELIABLE WATER SAVINGS ADOPTED BY CUWCC PLENARY APRIL 8, 1998, SEE SECTION F.]

b) Within two years from the adoption of this BMP, the Council will complete studies quantifying reliable savings attributable to the use of high-efficiency washing machines.

c) At the end of two years following the adoption of this BMP, the Council will appoint a committee to evaluate the effectiveness of triggering high-efficiency washing machine financial incentive programs operated by MOU signatories with programs operated by energy service providers. This committee will consist of 2 group 1 representatives, 2 group 2 representatives, and the CUWCC Administrator or Executive Director or his/her designee. This BMP will be modified by the appointed committee to require agencies to implement financial incentive programs for high-efficiency washing machines whenever cost-effective and regardless of the absence of a program operated by an energy service provider if the committee concludes from available evidence the following:

- the CUWCC has verified that significant water savings are available from high-efficiency washing machines;
- there is widespread product availability; and
- financial incentive programs offered by energy service providers in California have either not materialized, been largely discontinued or significantly scaled back.

Water Purveyor Responsibilities

a) In conjunction with the CUWCC, support local, state, and federal legislation to improve efficiency standards for washing machines.

b) If an energy service provider or waste water utility within the service territory is offering a financial incentive for the purchase of high-efficiency washing machines, then the water agency shall also offer a cost-effective financial incentive based on the marginal benefits of the water savings. Incentive levels shall be calculated by using methods found in A Guide to Customer Incentives for Water Conservation prepared by Barakat and Chamberlain for the CUWA, CUWCC, and US EPA, February 1994. A water purveyor is not required to implement a financial incentive program if the maximum cost-effective rebate is less than $50.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

C.Coverage Requirements

Cost-effective customer incentive for the purchase of high-efficiency washing machine offered if incentives are being offered by local energy service providers or waste water utility.

D. Requirements for Documenting BMP Implementation

a) Customer incentives to purchase high-efficiency washing machines being offered by local energy service providers, if any.

b) Customer incentives to purchase high-efficiency washing machines being offered by agency, if any.

E. Criteria to Determine BMP Implementation Status

a) Agency has determined if energy service providers or waste water utilities operating within service territory offer financial incentives for the purchase of high-efficiency washing machines.

b) If energy service provider or waste water utility operating within agency's service territory is offering financial incentives, agency has calculated cost-effective customer incentive using methods found in A Guide to Customer Incentives for Water Conservation prepared by Barakat and Chamberlain for the CUWA, CUWCC, and US EPA, February 1994, and is offering this incentive to customers in service territory.

F. Water Savings Assumptions

The interim estimate of reliable annual water savings per replacement of a low-efficiency washing machine with a high-efficiency washing machine is 5,100 gallons, which is the mean yearly water savings derived from THELMA study data on water savings and washing machine load frequencies. Signatory water suppliers may use an estimate of annual water savings exceeding 5,100 gallons at their discretion, and may also select a lower estimate, so long as it is not below 4,600 gallons per year per retrofit, and there is a data supported reason for adopting an estimate lower than 5,100 gallons.

7. PUBLIC INFORMATION PROGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

a) Implement a public information program to promote water conservation and water conservation related benefits.

b) Program should include, but is not limited to, providing speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote water conservation practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agencies shall maintain an active public information program to promote and educate customers about water conservation.

D. Requirements for Documenting BMP Implementation

a) Number of public speaking events relating to conservation during reporting period

b) Number of media events relating to conservation during reporting period.

c) Number of paid or public service announcements relating to conservation produced or sponsored during reporting period.

d) Types of information relating to conservation provided to customers.

e) Annual budget for public information programs directly related to conservation.

E. Criteria to Determine BMP Implementation Status

Agency has implemented and is maintaining a public information program consistent with BMP 7's definition.

F. Water Savings Assumptions

Not quantified.

8. SCHOOL EDUCATION PROGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

a) Implement a school education program to promote water conservation and water conservation related benefits.

b) Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and class-room presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Education materials shall meet the state education framework requirements, and grade appropriate materials shall be distributed to grade levels K-3, 4-6, 7-8, and high school.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agencies shall maintain an active school education program to educate students in agencies' service areas about water conservation and efficient water uses.

D. Requirements for Documenting BMP Implementation

a) Number of school presentations made during reporting period.

b) Number and type of curriculum materials developed and/or provided by water supplier, including confirmation that curriculum materials meet state education framework requirements and are grade-level appropriate.

c) Number of students reached.

d) Number of in-service presentations or teacher's workshops conducted during reporting period.

e) Annual budget for school education programs related to conservation.

E. Criteria to Determine BMP Implementation Status

Agency has implemented and is maintaining a school education program consistent with BMP 8's definition.

F. Water Savings Assumptions

Not quantified.

9. CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL ACCOUNTS

A. Implementation

Implementation shall consist of at least the following actions:

a) Identify and rank commercial, industrial, and institutional customers according to use. For purposes of this BMP, commercial, industrial, and institutional customers are defined as follows:

Commercial Customers: any water use that provides or distributes a product or service, such as hotels, restaurants, office buildings, commercial businesses or other places of commerce. These do not include multi-family residences, agricultural users, or customers that fall within the industrial or institutional classifications.

Institutional Customers: any water-using establishment dedicated to public service. This includes schools, courts, churches, hospitals, and government facilities. All facilities serving these functions are to be considered institutions regardless of ownership.

Industrial Customers: any water users that are primarily manufacturers or processors of materials as defined by the Standard Industrial Classifications (SIC) Code numbers 2000 through 3999.

b) Within one year of the adoption of this BMP, the CUWCC shall establish long-term implementation targets for the replacement of high-water-using toilets with ULFTs in the CII sector. Implementation targets will be based on the findings of the CUWCC CII ULFT Water Savings Study.

EITHER

c) Implement a CII water-use survey and customer incentives program in accordance with the description below.

OR

d) Achieve water use reductions in the CII equaling or exceeding the targets described below.

CII Water Use Survey and Customer Incentives Program

Develop a customer targeting and marketing strategy to provide water use surveys and customer incentives to commercial, industrial, and institutional accounts. Directly contact (via letter, telephone, or personal visit) and offer water use surveys and customer incentives to at least 10% of commercial, industrial, and institutional accounts on a repeating basis. Water use surveys must include a site visit, an evaluation of all water-using apparatus and processes, and a customer report identifying recommended efficiency measures, their expected payback, and available agency incentives. Within one year of a completed survey, follow-up via phone or site visit with customer regarding facility water use and water saving improvements. Track customer contacts, customers receiving surveys, follow-ups, and measures implemented. The method for crediting water use surveys completed prior to the revision of this BMP is described in Section E of this Exhibit.

CII Conservation Performance Targets

Implement programs to reduce water use by commercial, industrial, and institutional accounts by an amount equal to 10% of baseline use of commercial, industrial, and institutional accounts in the agency's service area over a ten year period. The method for calculating water savings is described in Section E of this exhibit. Baseline use is defined as the

use by commercial, industrial, and institutional accounts in 1989. Water purveyors may justify to the CUWCC the use of an alternative baseline year.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

c) The coverage requirement for this BMP, as specified in Section C of this Exhibit, shall be realized within 10 years of the date implementation was to commence.

C. Coverage Requirements

CII Water Use Survey and Customer Incentives Program

10% of commercial, industrial, and institutional customers to accept a water use survey within 10 years of the date implementation is to commence.

CII Conservation Performance Targets

Reduce water use by commercial, industrial, and institutional customers by an amount equal to 10% of the use of baseline commercial, industrial, and institutional water use within 10 years of the date implementation is to commence.

D. Requirements for Documenting BMP Implementation

The number of customers and amount of water use within the commercial, industrial, and institutional customer classes.

CII Water Use Survey and Customer Incentives Program

a) The number of commercial, industrial, and institutional customers offered water use surveys during the reporting period.

b) The number of new water use surveys completed during the reporting period.

c) The number of follow-ups completed during the reporting period.

d) The type and number of water saving recommendations implemented.

e) Incentive program budget and customer outlays.

CII Conservation Performance Targets

The estimated reduction in water use by commercial, industrial, and institutional accounts due to agency programs, interventions, and actions. Agencies must document how savings were realized and the method and calculations for estimating savings.

E. Criteria to Determine BMP Implementation Status

Agency has identified and ranked by water use its commercial, industrial, and institutional accounts.

CII Water Use Survey and Customer Incentives Program

D-046467

a) Agency has developed and implemented a strategy targeting and marketing water use surveys to commercial, industrial, and institutional accounts by the end of the first reporting period following the date implementation is to commence.

b) Agency is on schedule to complete surveys for 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of the date implementation is to commence. Agencies may credit 50% of the number of surveys completed prior to July 1, 1996 that have not received follow-up verification of implementation, and 100% of the number of surveys completed prior to July 1, 1996 that have received a follow-up survey. Agencies may credit 100% of the number of surveys completed after July 1, 1996 against the coverage requirement.

c) Agencies will be considered on track if the percent of commercial, industrial, and institutional accounts receiving a water use survey equals or exceeds the following: 0.5% by end of first reporting period following date implementation is to commence; 2.4% by end of second reporting period; 4.2% by end of third reporting period; 6.4% by end of fourth reporting period; and 9.0% by end of fifth reporting period.

CII Conservation Performance Targets

a) Agency is on schedule to reduce water use by commercial, industrial, and institutional accounts by an amount equal to 10% of baseline use (as defined in Section A of this Exhibit) for commercial, industrial, and institutional accounts within 10 years of the date implementation is to commence.

b) Agencies will be considered on track if estimated savings as a percent of baseline water use equals or exceeds the following: 0.5% by end of first reporting period following date implementation is to commence; 2.4% by end of second reporting period; 4.2% by end of third reporting period; 6.4% by end of fourth reporting period; and 9.0% by end of fifth reporting period.

c) Credited water savings must be realized through agency actions performed to increase water use efficiency within the CII sector. Agencies may credit 100% of estimated annual savings of interventions since 1991 that have been site verified, and 25% of estimated annual savings of interventions that have not been site verified.

d) Agencies may claim the estimated savings for regulations, ordinances, or laws intended to increase water use efficiency by the CII sector, subject to the review and approval of the savings estimates by the CUWCC. To avoid double counting, agencies justifying savings on the basis of rate structure changes may not claim savings from any other actions undertaken by CII customers, third parties, or the agency.

Combined Targets

Agencies may choose different tracks for different CII customer classes, and will be considered in compliance with this BMP if they are on track to meet each applicable coverage requirement for each class. In addition, agencies may implement both tracks for a given CII customer class, and will be considered in compliance with this BMP if the percent of surveys completed and the percent of water savings realized, when added together, equals or exceeds the applicable compliance requirement. For example, at the end of the second reporting cycle an agency would be considered on track to meet the coverage requirement if the percent of surveys completed and the percent of water savings achieved, when added together, equaled or exceeded 2.4%. Agencies may combine tracks only if they make a convincing demonstration that savings attributable to counted surveys are not also included in their estimate of water savings for meeting the water savings performance track.

F. Water Savings Assumptions

Commercial water reduction results from Best Management Practices such as Interior and Landscape Water Surveys, Plumbing Codes, and Other Factors but exclude Ultra Low Flush Toilet Replacement. (Includes savings accounted for in other BMPs) Estimated reduction in gallons per employee per day in year 2000 use occurring over the period 1980-2000: 12%.

Industrial water reduction results from Best Management Practices, Waste Discharge Fee, New Technology, Water Surveys, Plumbing Codes and Other Factors, but exclude Ultra Low Flush Toilet Replacement. (Includes savings accounted for in other BMPs) Estimated reduction in gallons per employee per day in year 2000 use occurring over the period 1980-2000: 15%.

10. WHOLESALE AGENCY ASSISTANCE PROGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

Financial Support

a) Wholesale water suppliers will provide financial incentives, or equivalent resources, as appropriate and beneficial, to their retail water agency customers to advance water conservation efforts and effectiveness.

b) All BMPs implemented by retail water agency customers which can be shown to be cost-effective in terms of avoided cost of water from the wholesaler's perspective, using CUWCC cost-effectiveness analysis procedures, will be supported.

Technical Support

Wholesale water agencies shall provide conservation-related technical support and information to all retail agencies for whom they serve as a wholesale supplier. At a minimum this requires:

c) Conducting or funding workshops addressing the following topics:

i) CUWCC procedures for calculating program savings, costs and cost-effectiveness.

ii) Retail agencies' BMP implementation reporting requirements.

iii) The technical, programmatic, strategic or other pertinent issues and developments associated with water conservation activities in each of the following areas: ULFT replacement; residential retrofits; commercial, industrial and institutional surveys; residential and large turf irrigation; and conservation-related rates and pricing.

d) Having the necessary staff or equivalent resources available to respond to retail agencies' technical and programmatic questions involving CUWCC's BMPs and their associated reporting requirements.

Program Management

e) When mutually agreeable and beneficial, the wholesaler may operate all or any part of the conservation-related activities which a given retail supplier is obligated to implement under the BMP's cost-effectiveness test. The inability or unwillingness of the wholesaler to perform this function, however, in no way relieves or reduces the retailer's obligation to fully satisfy the requirements of all BMPs which are judged cost-effective from the retailer's perspective.

Water Shortage Allocations

Wholesale agencies shall work in cooperation with their customers to identify and remove potential disincentives to long-term conservation created by water shortage allocation policies; and to identify opportunities to encourage and reward cost-effective investments in long-term conservation shown to advance regional water supply reliability and sufficiency.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

a) Cost-effectiveness assessments completed for each BMP the agency is potentially obligated to support. The methodology used will conform to CUWCC standards and procedures, and the information reported will be sufficient to permit independent verification of the cost-effectiveness calculations and of any exemptions claimed on cost-effectiveness grounds.

b) Agency avoided cost per acre-foot of new water supplies. The methodology used will conform to CUWCC standards and procedures, and the information reported will be sufficient to permit independent verification of the avoided cost calculations.

c) The total monetary amount of financial incentives and equivalent resources provided to retail members to assist, or to otherwise support, the implementation of BMPs.

d) The total amount of verified water savings achieved by each wholesaler-assisted BMP.

D. Requirements for Documenting BMP Implementation

a) The total monetary amount of financial incentives and equivalent resources provided to retail members to assist, or to otherwise support, the implementation of BMPs, subtotaled by BMP.

b) The total amount of verified water savings achieved by each wholesaler-assisted BMP.

E. Criteria to Determine BMP Implementation Status

a) Timely and complete reporting of all information as provided for above under "Reporting and Record Keeping Requirements."

b) Offering workshops covering all topics listed above under "Technical Support."

c) Timely reconciliation of wholesaler and retailer BMP reports as provided for above under "BMP Reporting."

F. Water Savings Assumptions

Not quantified.

11. CONSERVATION PRICING

A. Implementation

Implementation methods shall be at least as effective as eliminating nonconserving pricing and adopting conserving pricing. For signatories supplying both water and sewer service, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.

a) Nonconserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components: rates in which the unit price decreases as the quantity used increases (declining block rates);rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used; pricing in which the typical bill is determined by high fixed charges and low commodity charges.

b) Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the long-run marginal cost or the cost of adding the next unit of capacity to the system.

c) Adoption of lifeline rates for low income customers will neither qualify nor disqualify a rate structure as meeting the requirements of this BMP.

CUWCC Rate Impact Study

Within one year of the adoption of this BMP revision, the CUWCC shall undertake a study to determine the relative effect of conservation rate structure influence on landscape and indoor water use. The study shall develop sample areas that incorporate varying rate structure environments (e.g., low, uniform commodity rates,; high uniform commodity rates; increasing block rates, etc.). As practical, the study shall utilize direct metering of customer end uses, and shall control for weather, climate, land use patterns, income, and other factors affecting water use patterns. If the study shows significant potential savings, as determined by a balanced committee of voting Council representatives, a revised pricing BMP containing numeric targets or other appropriate standards shall be developed for a CUWCC vote.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing

D. Requirements for Documenting BMP Implementation

a) Report annual revenue requirement by customer class for the reporting period.

b) Report annual revenue derived from commodity charges by customer class for the reporting period.

c) Report rate structure by customer class for water service and sewer service if provided.

E. Criteria to Determine BMP Implementation Status

Agency rate design shall be consistent with the BMP 11's definition of conservation pricing.

F. Water Savings Assumptions

Not quantified.

12. CONSERVATION COORDINATOR

A. Implementation

Implementation shall consist of at least the following actions:

a) Designation of a water conservation coordinator and support staff (if necessary), whose duties shall include the following:

   i) Coordination and oversight of conservation programs and BMP implementation;

   ii) Preparation and submittal of the CUWCC BMP Implementation Report;

   iii) Communication and promotion of water conservation issues to agency senior management; coordination of agency conservation programs with operations and planning staff; preparation of annual conservation budget; participation in the CUWCC, including regular attendance at CUWCC meetings; and preparation of the conservation elements of the agency's Urban Water Management Plan.

b) Agencies jointly operating regional conservation programs are not expected to staff duplicative and redundant conservation coordinator positions.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

D. Requirements for Documenting BMP Implementation

a) Conservation Coordinator name, staff position, and years on job;

b) Date Conservation Coordinator position created by agency;

c) Number of Conservation Coordinator staff;

d) Duties of Conservation Coordinator and staff.

E. Criteria to Determine BMP Implementation Status

a) Creating and staffing a Conservation Coordinator position within the agency organization.

b) Providing the Conservation Coordinator with the necessary resources to implement cost-effective BMPs and prepare and submit CUWCC BMP Implementation Reports.

F. Water Savings Assumptions

Not quantified.

13. WATER WASTE PROHIBITION

A. Implementation

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyer car wash and commercial laundry systems, and nonrecycling decorative water fountains.

Signatories shall also support efforts to develop state law regarding exchange-type water softeners that would: (1) allow the sale of only more efficient, demand-initiated regenerating (DIR) models; (2) develop minimum appliance efficiency standards that (a) increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used; and (b) implement an identified maximum number of gallons discharged per gallon of soft water produced; (3) allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.

Signatories shall also include water softener checks in home water audit programs and include information about DIR and exchange-type water softeners in their educational efforts to encourage replacement of less efficient timer models.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agency shall adopt water waste prohibitions consistent with the provisions for this BMP specified in Section A of this Exhibit.

D. Requirements for Documenting BMP Implementation

Description of water waste prohibition ordinances enacted in service area.

E. Criteria to Determine BMP Implementation Status

Agency's water waste prohibition ordinances meet the requirements of the BMP definition.

F. Water Savings Assumptions

Not quantified.

14. RESIDENTIAL ULFT REPLACEMENT PROGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

a) Implementation of programs for replacing existing high-water-using toilets with ultra-low-flush (1.6 gallons or less) toilets in single-family and multi-family residences.

b) Programs shall be at least as effective as requiring toilet replacement at time of resale; program effectiveness shall be determined using the methodology for calculating water savings in Exhibit 6 of this MOU.

After extensive review, on July 30 1992, the Council adopted EXHIBIT 6, "ASSUMPTIONS AND METHODOLOGY FOR DETERMINING ESTIMATES OF RELIABLE SAVINGS FROM THE INSTALLATION OF ULF TOILETS." EXHIBIT 6 provides a methodology for calculating the level of effort required to satisfy BMP 13.

B. Implementation Schedule

a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.

b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

c) The coverage requirement for this BMP, as specified in Section C of this Exhibit, shall be realized within 10 years of the date implementation was to commence.

C. Coverage Requirements

Water savings from residential ULFT replacement programs to equal or exceed water savings achievable through an ordinance requiring the replacement high-water-using toilets with ultra-low-flow toilets upon resale, and taking effect on the date implementation of this BMP was to commence and lasting ten years.

D. Requirements for Documenting BMP Implementation

a) The number of single-family residences and multi-family units in service area constructed prior to 1992.

b) The average number of toilets per single-family residence; the average number of toilets per multi-family unit.

c) The average persons per household for single-family residences; the average persons per household for multi-family residences.

d) The housing resale rate for single-family residences in service area; the housing resale rate for multi-family residences in service area.

e) The number of ULFT installations credited to the agency's replacement program, by year.

f) Description of ULFT replacement program

g) Estimated cost per ULFT replacement

h) Estimated water savings per ULFT replacement

E. Criteria to Determine BMP Implementation Status

Calculated ULFT replacement program water savings at the end of each reporting period are within 10% of calculated retrofit-on-resale water savings, using Exhibit 6 methodology and water savings estimates.

F. Water Savings Assumptions

See Exhibit 6.

POTENTIAL BEST MANAGEMENT PRACTICES

This section contains Potential Best Management Practices (PBMPs) that will be studied. Where appropriate, demonstration projects will be carried out to determine if the practices meet the criteria to be designated as BMPs. Within one year of the initial signing of this MOU, the Council will develop and adopt a schedule for studies of these PBMPs.

1. RATE STRUCTURE AND OTHER ECONOMIC INCENTIVES AND DISINCENTIVES TO ENCOURAGE WATER CONSERVATION.

   This is the top priority PBMP to be studied. Such studies should include seasonal rates; increasing block rates; connection fee discounts; grant or loan programs to help finance conservation projects; financial incentives to change landscapes; variable hookup fees tied to landscaping; and interruptible water service to large industrial, commercial or public customers. Studies on this PBMP will be initiated within 12 months from the initial signing of the MOU. At least one of these studies will include a pilot project on incentives to encourage landscape water conservation.

2. EFFICIENCY STANDARDS FOR WATER USING APPLIANCES AND IRRIGATION DEVICES
3. REPLACEMENT OF EXISTING WATER USING APPLIANCES (EXCEPT TOILETS AND SHOWERHEADS WHOSE REPLACEMENTS ARE INCORPORATED AS BEST MANAGEMENT PRACTICES) AND IRRIGATION DEVICES.
4. RETROFIT OF EXISTING CAR WASHES.
5. GRAYWATER USE
6. DISTRIBUTION SYSTEM PRESSURE REGULATION.
7. WATER SUPPLIER BILLING RECORDS BROKEN DOWN BY CUSTOMER CLASS
8. SWIMMING POOL AND SPA CONSERVATION INCLUDING COVERS TO REDUCE EVAPORATION
9. RESTRICTIONS OR PROHIBITIONS ON DEVICES THAT USE EVAPORATION TO COOL EXTERIOR SPACES.
10. POINT-OF-USE WATER HEATERS, RECIRCULATING HOT WATER SYSTEMS AND HOT WATER PIPE INSULATION.
11. EFFICIENCY STANDARDS FOR NEW INDUSTRIAL AND COMMERCIAL PROCESSES.

EXHIBIT 2. CALIFORNIA URBAN WATER CONSERVATION COUNCIL

1. The California Urban Water Conservation Council (the "Council") will be comprised of a representative of each of the signatories to the MOU.

2. The Council will be housed by California Urban Water Agencies ("CUWA"). The Council will act independently of CUWA on all technical and policy issues. CUWA will be responsible for the initial funding and ensuring that the Council's administrative and general office needs are met. CUWA will retain the right to withdraw from this relationship at any time upon 180 days written notice to the Council. The Council recognizes that its funding requirements may exceed what CUWA is prepared to contribute and that alternative funding may be needed.

3. The Council's responsibilities and authorities include:

   a. Recommending study methodologies for Best Management Practices ("BMPs"), including procedures for assessing the effectiveness and reliability of urban water conservation measures.

   b. Developing guidelines including discount rate to be used by all signatories in computing BMP benefits and costs pursuant to Exhibit 3.

   c. Reviewing and modifying the economic principles set forth in Exhibit 3.

   d. Collecting and summarizing information on implementation of BMPs and Potential Best Management Practices ("PBMPs").

   e. Adopting or modifying BMPs and PBMPs lists.

   f. Adopting or modifying reliable water conservation savings data for BMPs.

   g. Adopting or modifying the schedules of implementation for existing and new BMPs.

   h. Adopting or modifying the schedules for research and demonstration projects for BMPs and PBMPs.

   I. Coordinating and/or making recommendations regarding BMPs study and demonstration projects.

   j. Accepting or denying requests for additional parties to join the MOU and assigning additional parties to one of the three signatory groups as described in Section 1.3 of the MOU.

   k. Reviewing and modifying report formats.

   l. Making annual reports to the State Water Resources Control Board and the Council Members on the above items based on the format described in Exhibit 5.

   m. Within two years of the initial signing of this MOU, developing and implementing procedures and a funding mechanism for independent evaluation of the MOU process at the Council and signatory levels.

   n. Undertaking such additional responsibilities as the Members may agree upon.

4. The Council will make formal reports to the State Water Resources Control Board and to the governing bodies of all Council Members. Such reports shall include a formal annual written report. Other reports such as status reports and periodic updates may be prepared as deemed appropriate

by the Council. Any Member of the Council will be entitled to review draft reports and comment on all reports. Such comments shall be included in any final report at the Member's request.

5. It is anticipated that the Council will develop a committee structure, which will include a Membership Committee as described in Section 7.2 of the MOU. A Steering Committee and one or more technical committees may also be needed.

6. For purposes of the Council, signatories will be divided into three groups: water suppliers ("Group 1"), public advocacy organizations ("Group 2") and other interested groups ("Group 3") as those terms are defined in Section 1 of the MOU. Members of Groups 1 and 2 shall be members of the Council and shall possess all voting rights. Members of Group 3 shall not have voting rights, but shall act in an advisory capacity to the Council.

7. Decisions by the Council to undertake additional responsibilities; to modify the MOU itself; or to modify Exhibits 2 or 3 require the following:

   a. The Council will provide notice to all signatories giving the text of the proposed action or modification at least 60 days in advance of the vote by the Council.

   b. To pass the action or modification, there must be a vote in favor of the action or modification by at least 2/3 of the members of Group 1 voting, including votes made in person or in writing, and a vote in favor of the action or modification by at least 2/3 of the members of Group 2 voting, including votes made in person or in writing.

8. All other modifications and Council actions shall be undertaken as follows: There must be a vote in favor of the modification or action by a simple majority of the members of Group 1 voting, including votes made in person or in writing, and a vote in favor of the modification or action by a simple majority of the members of Group 2 voting, including votes made in person or in writing.

EXHIBIT 3. PRINCIPLES TO GUIDE THE PERFORMANCE OF BMP ECONOMIC (COST-EFFECTIVENESS) ANALYSES

1. The total cost-effectiveness of a conservation measure will be measured by comparing the present value of the benefits of the measure listed in paragraph 3 below to the present value of the costs listed in paragraph 4. The measure will be cost-effective if the present value of the benefits exceeds the present value of the costs.

2. The cost-effectiveness of a conservation measure to the water supplier will be measured by comparing the present value of the benefits described in paragraph 5 to the present value of the costs described in paragraph 6. The measure will be cost-effective if the present value of the benefits exceeds the present value of the costs.

3. Total benefits exclude financial incentives received by water suppliers or by retail customers. These benefits include:
   a. avoided capital costs of production, transport, storage, treatment, wastewater treatment and distribution capacity.
   b. avoided operating costs, including but not limited to, energy and labor
   c. environmental benefits and avoided environmental costs
   d. avoided costs to other water suppliers, including those associated with making surplus water available to other suppliers
   e. benefits to retail customers, including benefits to customers of other suppliers associated with making surplus water available to these suppliers

4. Total program costs are those costs associated with the planning, design, and implementation of the particular BMP, excluding financial incentives paid either to other water suppliers or to retail customers. These costs include:
   a. capital expenditures for equipment or conservation devices
   b. operating expenses for staff or contractors to plan, design, or implement the program
   c. costs to other water suppliers
   d. costs to the environment
   e. costs to retail customers

5. Program benefits to the water supplier include:
   a. costs avoided by the water supplier of constructing production, transport, storage, treatment, distribution capacity, and wastewater treatment facilities, if any.
   b. operating costs avoided by the water supplier, including but not limited to, energy and labor associated with the water deliveries that no longer must be made.
   c. avoided costs of water purchases by the water supplier
   d. environmental benefits and avoided environmental costs
   e. revenues from other entities, including but not limited to revenue from the sale of water made available by the conservation measure and financial incentives received from other entities

6. Program costs to the water supplier include:
   a. capital expenditures incurred by the water supplier for equipment or conservation devices
   b. financial incentives to other water suppliers or retail customers
   c. operating expenses for staff or contractors to plan, design, or implement the program

d. costs to the environment

7. The California Urban Water Conservation Council ("Council") will be responsible for developing guidelines that will be used by all water suppliers in computing BMP benefits and costs. These guidelines will include, but will not be limited to, the following issues:

   a. analytical frameworks

   b. avoided environmental costs

   c. other impacts on the supply system that may be common to many water suppliers

   d. time horizons and discount rates

   e. avoided costs to non-water supply agencies
   f. benefits and costs to retail customers
   g. benefits of water made available to other entities as a result of conservation efforts

These guidelines will recognize the uniqueness of individual water suppliers and will therefore not impose excessive uniformity.

[Note: In September 1996, the CUWCC adopted "Guidelines for Preparing Cost-Effectiveness Analyses of Urban Water Conservation Best Management Practices"]

8. Within these guidelines, each water supplier will be responsible for analyses of the cost-effectiveness of particular BMPs on its system. These analyses will be reviewed by the Council.

9. The Council will also be responsible for periodically reviewing the overall framework set forth in this Exhibit.

EXHIBIT 4. FORM LETTER TO SWRCB

John Caffrey, Chairman, and Members
State Water Resources Control Board
901 "P" Street
Sacramento, California 95801

Subject: Bay/Delta Proceedings:
Urban Water Conservation

Dear Chairman Caffrey and Members:

We are pleased to forward to you a copy of a "Memorandum of Understanding Regarding Urban Water Conservation in California" recently entered into by many urban water suppliers, public advocacy organizations, and other interested groups.

This Memorandum of Understanding was developed over a period of many months of fact-gathering and intensive negotiations. It commits the signatory water suppliers to good faith implementation of a program of water conservation which embodies a series of "Best Management Practices" for California's urban areas. It also commits all of the signatories to an ongoing, structured process of data collection through which other conservation measures, not yet in general use, can be evaluated as to whether they should be added to the list of Best Management Practices. Finally, it commits all signatories to recommending to this Board that the Best Management Practices identified in this Memorandum of Understanding be taken as the benchmark for estimating reliable savings for urban areas which utilize waters affected by the Bay/Delta proceedings. An important part of this program is the signatories' recognition of the need to provide long-term reliability for urban water suppliers and long-term protection of the environment.

To carry out these commitments, please be advised that each of the signatories has endorsed making the following recommendations to this Board:

1. That for purposes of the present Bay/Delta proceedings, implementation of the Best Management Practices process set forth in the Memorandum of Understanding represents a sufficient long-term water conservation program by the signatory water suppliers, recognizing that additional programs may be required during occasional water supply shortages.

2. That for purposes of the present Bay/Delta proceedings only, the Board should base its estimates of future urban water conservation savings on implementation of all of the Best Management Practices included in Section A of Exhibit 1 to the Memorandum of Understanding for the entire service area of the signatory water suppliers and only on those Best Management Practices, except for (a) the conservation potential for water supplied by urban agencies for agricultural purposes, or (b) in cases where higher levels of conservation have been mandated.

3. That for purposes of the present Bay/Delta proceedings, the Board should make its estimates of future urban water conservation savings by employing the reliable savings assumptions associated with those Best Management Practices set forth in Section C of Exhibit 1 to the Memorandum of Understanding. Measures for which reliable savings assumptions are not yet available should not be employed in estimating future urban water use.

4. That the Board should include a policy statement in the water rights phase of the present Bay/Delta proceedings supporting the Best Management Practices process described in the Memo-

randum of Understanding and should also consider that process in any documents it prepares pursuant to the California Environmental Quality Act as part of the present Bay/Delta proceedings.

It should be emphasized that the Memorandum of Understanding does not contain projections of population for California and, accordingly, none of the signatories to the Memorandum of Understanding are agreeing to recommend that any specific population levels be used by the Board in estimating future water demands. Furthermore, it should be noted that the signatories have retained the right to advocate any particular level of protection for the Bay/Delta Estuary, including levels of freshwater flows, and that the Memorandum of Understanding is not intended to address any authority or obligation of the Board to establish freshwater flow protections or to set water quality objectives for the Estuary. The Memorandum of Understanding is also not intended to address any authority of the Environmental Protection Agency.

Finally, as described in Section 5.1 of the MOU, the signatories have not limited their ability to propose different conservation practices, different estimates of savings or different processes in a forum other than the present Bay/Delta proceedings or for non-urban water suppliers or for other water management issues. Public advocacy organization signatories have not agreed to use the initial assumptions of reliable conservation savings in proceedings other than the present Bay/Delta proceedings. The signatories may present other assumptions of reliable conservation savings for non-signatory water suppliers in the Bay/Delta proceedings, provided that such assumptions could not adversely impact the water supplies of signatory water suppliers.

The Memorandum of Understanding establishes an ongoing process for study and research in the field of urban water conservation and an organizational structure to support this effort, which is described in Exhibit 2 to the Memorandum of Understanding. The process is dynamic and contemplates periodic revisions to the list of Best Management Practices, as well as refinements to the savings assumptions based on continuing field studies. The California Urban Water Conservation Council will forward updated lists of Best Management Practices and updated savings assumptions to the Board as they become available. However, for the present Bay/Delta proceedings, the measures and savings assumptions listed on Exhibit 1 should be used as described above.

The Memorandum of Understanding is a significant accomplishment and one of which all the parties are proud. We hope it will be of value to the Board in the complex and important Bay/Delta proceedings. By copy of this letter, we are forwarding these recommendations to the Environmental Protection Agency.

Very Truly Yours,

Name of Signatory

By:_____

cc: Administrator
U.S. Environmental Protection Agency
401 "M" Street, SW
Washington, D.C. 20460

Regional Administrator, Region IX
U.S. Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

D-046484

EXHIBIT 5. SWRCB ANNUAL REPORT OUTLINE

I. Executive Summary

II.Implementation Assessment

Water Suppliers' Report
- Findings
- Comments
- Progress

Public Advocacy Organizations' Report
- Findings
- Comments
- Progress

III. Survey Results for 199X

Summary of Survey Responses
- Table ___. Per Capita Usage [by region]
- Table ___. Status of BMP Implementation [by supplier]
- Table ___. Proposed Implementation Schedules

Interpretation of Survey Responses
- Lack of Data
- Climatic Influences
- Implementation Difficulties

Evaluation of Results

IV. Trend Analysis

Comparison with Prior Years
- Table ___. Per Capita Usage [by region]

Projected Conservation
- Table ___. Schedule of Implementation

Updated Estimates of Future Savings [by region]

Evaluation of Progress

V. Studies of Best Management Practices

Assessment of Current BMPs
- Table ___. Evaluation of Effectiveness [by measure and region]

Assessment of Potential BMPs
- Status of Current Studies
- Proposed Future Studies

Revision of Lists of Current and Potential BMPs

EXHIBIT 6. ASSUMPTIONS AND METHODOLOGY FOR DETERMINING ESTIMATES OF RELIABLE WATER SAVINGS FROM THE INSTALLATION OF ULF TOILETS

July 1992

Approved June 30, 1992
California Urban Water Conservation Council

SUMMARY

On June 30, 1992, the California Urban Water Conservation Council (CUWCC) adopted the assumptions and methodology described in this report for determining estimates of reliable water savings from the installation of ULF toilets. The Council voted to provide only a method for estimating ULF toilet conservation potential, not specific estimates for different regions or agencies.

The methodology presented here was explicitly developed to balance simplicity and accuracy. The method allows a water agency to customize the estimate of conservation potential by using service-area-specific information on household demographics, composition of housing stock, and turnover rates of real estate. Agencies lacking service area specific information can use regional averages. Given the large supply of conserved water that ULF toilets represent, the Council feels that the method's adjustments of estimated conservation potential for different local conditions is well worth the extra effort.

The first step required to estimate a given area's conservation potential is to assess water savings likely to result per ULF toilet retrofit. We provide a scheme for adjusting estimates of water savings that were realized by first-year participants in the Los Angeles and Santa Monica toilet rebate programs to make these estimates suitable for other service areas. Water savings estimates for participating households in Los Angeles and Santa Monica were derived through sophisticated statistical models based on data provided by over 23,000 households covering a seven year period[1]. These reliable estimates of conservation form the best basis for extrapolating to other service areas. These estimates should not be used directly, but must be adjusted for three service-area-specific factors: 1) people per household; 2) toilet retrofits per household; and 3) the mix of pre-1980 and post-1980 toilets.

The method and assumptions presented here apply to BMP 14 as defined by Exhibit 1 of the MOU.

BMP 14 requires water suppliers to implement programs for replacement of existing high-water-using toilets with ultra-low-flush toilets (1.6 gallon or less) in residential commercial, and industrial buildings. As per BMP 14, such programs should be at least as effective as offering rebates of up to $100 for each replacement that would not have occurred without the rebate, or requiring replacement at the time of resale, or requiring replacement at the time of change of service. BMP 14 lists three alternatives that indicate compliance. The Subcommittee selected the second alternative, a bill requiring replacement of non-ULF toilets with ULF toilets when a property exchanges hands, as a quantifiable way for determining each service area's water conservation target. Furthermore, this framework allows the assessment of both the total water conservation target for each service area and the rate at which these targets must be met. BMP differs from other BMPs in that it is defined in terms of water savings instead of a level of activity.

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[1] See The Conserving Effect of Ultra Low Flush Toilet Rebate Programs, Chesnutt, T., A. Bamezai, C. McSpadden, A & N Technical Services, June 1992, and related reports listed in Appendix A.

Restated, water savings targets implied by BMP 14 come from calculating the effect of ULF replacement of all non-ULF toilets at the time of resale or exchange. This requires combining information about estimated per-household water savings with information about housing turnover rates and the natural toilet replacement rate. We present detailed analyses for a hypothetical service area to describe the methodology in detail.

According to the MOU, water suppliers will commit to saving water that is implied by BMP 14 through ULF toilet retrofit programs. This should not be interpreted to mean that such a legislation will actually be in place. It is a hypothetical scenario that is to be used for determining urban water conservation targets for each service area. Any water conservation program will be acceptable as long as it saves water that is implied by BMP 14; these program choices rest solely with each service area[2]. Water suppliers will calculate the amount of water to be saved for BMP 14 using the method described herein, and then achieve that targeted amount using a ULF program of their own choice.

As stated in the MOU, the Council voted and agreed that estimates of reliable savings potential are to be used. The Council agreed that the reliable estimate lies in the 50 percent to 90 percent range of statistical confidence. The Council did not reach consensus on the exact level of reliability to be used in calculating estimates of ULFT conservation potential. This issue is to be resolved at the next plenary session in September. Until such time as a precise level of desired reliability in estimated savings can be formally addressed by the Council, it should be noted that the magnitude of ULFT conservation potential does not change substantially under different assumptions. Due to the high quality of the statistical data, the agreed 50 to 90 percent range translates to a difference in estimated conservation of only three percent. The Council recognizes that the estimates of reliable savings can be changed as better information become available.

The Council has decided to postpone a formal recommendation on estimates of ULFT conservation potential for the commercial/industrial retrofits. Presently available data is too weak to support a reliable estimate. Studies are currently underway to address the conservation potential of commercial/industrial ULFT retrofits, and the Council expects to address this issue next year.

I. INTRODUCTION

There are several ways to realize water savings from ULF toilets. The 1991 plumbing code requires installation of ULF toilets in new construction. Additionally, the State of California enacted legislation banning the sale and installation of non-ULF toilets resulting in natural replacement of existing toilets with ULF toilets as and when existing toilets begin to malfunction, are damaged, or households decide to remodel their bathrooms. Programs that affect the replacement of non-ULF toilets with ULF toilets (BMP 14), would additionally affect the existing housing stock.

This report describes a methodology for quantifying the conservation targets under BMP 14. In particular, the ULF Toilet Subcommittee has selected ULF replacement-upon-resale-or-exchange legislation as a quantifiable way for determining ULF conservation targets (under BMP 14) over a period of 10 years. The calculations required to quantify this legislation, and hence BMP 14, also yield information on the water saving potential of the other ULF-related BMP's. To keep estimates of ULF conservation potential accurate, it is important not to double count conservation from the different types of ULF programs.

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2 For example, although a legislation that requires ULF retrofits upon resale or exchange implies that all non-ULF toilets in a home must be replaced when it is sold, this need not be the actual goal of a toilet retrofit program. The evaluation of ULF toilet rebate programs shows that the first toilet retrofit in a home is far more effective than subsequent retrofits, and that retrofits in multiple family complexes are more effective than retrofits in single family households. Thus, by increasing the coverage of ULF toilet rebate programs instead of within-household penetration, and emphasizing retrofits in multiple family complexes over retrofits in single family households, a water supplier may be able to achieve water savings implied by BMP 14 ~~16~~ using a smaller number of ULF toilet replacements.

Our basic method can be described as multiplying how much water ULF toilets save in a household by the number of households affected. Both of these quantities will vary in different service areas and are discussed in turn.

First, the quantity of water likely to be saved by a ULF toilet retrofit will vary in different service areas because of differences in household characteristics and age of the housing stock. Section II describes how we estimate water savings from ULF retrofits for different service areas.

Second, the number of affected homes will vary in different service areas due to differences in housing turnover rates and differences in the rate at which toilets are naturally replaced because of either damage, malfunction, or bathroom remodeling. Since, at the time of malfunction or breakdown some toilets are likely to be retrofitted with ULF toilets, the net water saving effect of BMP 14 will be overstated if this is not taken into account. Section III deals with this second set of issues. Section IV contains illustrative calculations for a hypothetical service area.

II. ESTIMATING PER-HOUSEHOLD WATER SAVINGS

The household water saving estimates are based on the evaluation of Los Angeles' and Santa Monica's ULF toilet rebate programs. Using the results of this evaluation it was possible to quantify how household water savings vary with the number of people that reside in a household, the number of toilets that are retrofitted in a home, and the type of toilet replaced. Thus, to extrapolate water savings estimates to other service areas requires three pieces of information at the service area level:

- Average number of people per household
- Average number of toilets per household
- Mix of pre-1980 and post-1980 toilets

To simplify the calculation of how these factors are related to expected household water savings, planning tables are provided for single and multiple family households. Table 1 shows expected average water savings per single family household per day corresponding to different service area characteristics (persons per household and toilets per household.) Table 2 shows similar information for multiple family units. So, for example, if in a service area the average number of people that reside in single family homes is 2.7 and the average number of toilets per single family home is 2, then approximately 43.3 gallons of water will be saved per day if both toilets are replaced with ULF toilets[3].

The water savings estimates shown in Tables 1 and 2 make no adjustment for differences in the mix of pre-1980 and post-1980 toilets[4]. If information about the existing mix of toilets is available the water saving estimates can be further refined. The default values implied by the planning tables reflect the combined experience of Los Angeles and Santa Monica--approximately 7.5 percent of all toilets replaced in single family households and 12.5 percent replaced in multiple family units were

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[3] If in a service area, the average number of people residing in single family homes exceeds 3, we recommend choosing a water savings estimate from Table 1 assuming the average is 3. This is because we had only a handful of households that reported having greater than 3 residents and therefore we were unable to derive reliable estimates of water savings for these larger households. The error this approximation is likely to produce is minimal because we found that, in general, water savings grow less than linearly as population density increases in a household.

[4] Effective January 1, 1978, all new dwelling units and lodging rooms in California were required to have toilets that used no more than 3.5 gallons per flush. Though there was no grace period in the law, it is widely believed that implementation and enforcement of this law was initially spotty. We have selected 1980 as the effective year of implementation. The requirement for 3.5 gallon-per-flush toilets was extended to virtually all new construction, effective January 1, 1983. (An exemption was allowed for blowout toilets used in some public restrooms.)

of the post-1980 (3.5 gallon/flush) variety. If water planners know how their service area differs from this mix of toilets, the following section describes how to incorporate that information.

Based on the data available from the first year of ULF rebate programs, we estimate that retrofitting a post-1980 (3.5 gl./flush toilet) saves 20 percent less than retrofitting a pre-1980 toilet[5]. If one does know the proportion of post-1980 toilets in a service area, then this information can be used to adjust any of the estimates of conservation. Since the overall mean net conservation provided in Tables 1 and 2 is a weighted average of pre- and post 1980 toilets, we can back out separate savings estimates for pre-1980 and post-1980 toilets. These estimates can then be applied to the proportion of the housing stock that has each type of toilet.

The adjustment factors come from combining our knowledge of the proportion of post- 1980 toilets (7.5 percent in single family homes) with how much less water retrofits of post-80 toilets save relative to pre-1980 toiles (about 20 percent). We state the following two equations:

$$\overline{N_{SF}} = N_{post80} \times 0.075 + N_{pre80} \times 0.925$$
$$N_{post80} = N_{pre80} \times 0.8$$

and solve for N_{pre80} and N_{post80} in terms of the overall single family mean $\overline{N_{SF}}$:

$$N_{pre80} = \overline{N_{SF}} \div (0.8 \times 0.075 + 0.925) \approx \overline{N_{SF}} \times 1.015$$
$$N_{pre80} = \overline{N_{SF}} \times 1.015 \times 0.8 \approx \overline{N_{SF}} \times 0.812 \quad (1)$$

Changing for the proportion of post-80 toilets in the multiple family sample (about 12.5 percent), we can find the comparable relationships between the multiple family overall savings and pre-/post-80 toilet savings:

$$N_{pre80} = \overline{N_{MF}} \div (0.8 \times 0.125 + 0.875) \approx \overline{N_{MF}} \times 1.0255$$
$$N_{post80} \approx \overline{N_{MF}} \times 1.026 \times 0.8 \approx \overline{N_{MF}} \times 0.8205 \quad (2)$$

Thus, if there is information on the mix of pre-/post-1980 toilets in a service area, the overall mean water savings given in Tables 1 and 2 should be separated into its two components: the mean for pre-1980 toilets and the mean for post-1980 toilets. For single family households, the mean for pre-1980 toilets can be derived by multiplying the overall mean from Table 1 by 1.015 and the mean for post-1980 toilets can be derived by multiplying the overall mean from Table 1 by 0.812. For multiple family households, the mean for pre-1980 toilets can be derived by multiplying the overall mean from Table 2 by 1.0255 and the mean for post-1980 toilets can be derived by multiplying the overall mean from Table 2 by 0.8205.

[5] Our estimate is an empirical one based on observed retrofits in Los Angeles and Santa Monica. It can differ from theoretical calculations based upon design specifications of toilets meeting the 1980 plumbing code versus those that do not for several reasons. Toilets may use less on average if they were designed conservatively or they may use more if the earlier 1980-compliant designs resulted in more double flushes. Many supposedly 5-7 gl./flush toilets actually use 4-5 gl/flush in laboratory tests. Furthermore, the average rate at which toilets develop leaks and the preexisting installation of toilet dams or bags can alter theoretical calculations. Since no one knows, or can know, the true average amount of water used per flush across the mix of installed toilets in a service area, we believe this issue is moot.

Table 1. Planning Table for Estimating Water Savings in Service Areas with Different Household Characteristics
Single Family Household
(Gallons per Household per Day)

Persons per Household	Toilets Per Household															
	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
2.0	22.8	24.3	25.7	27.1	28.5	29.9	31.3	32.7	34.1	35.5	37.0	38.4	39.8	41.2	42.6	44.0
2.1	23.8	25.4	27.0	28.5	30.0	31.5	33.0	34.5	36.0	37.4	38.9	40.4	41.8	43.3	44.6	45.9
2.2	24.6	26.4	28.0	29.6	31.2	32.8	34.3	35.9	37.4	38.9	40.4	41.9	43.4	44.8	46.1	47.4
2.3	25.3	27.1	28.8	30.5	32.2	33.8	35.4	37.0	38.5	40.0	41.6	43.0	44.5	45.9	47.2	48.4
2.4	25.8	27.7	29.5	31.2	32.9	34.6	36.2	37.8	39.3	40.9	42.4	43.8	45.2	46.6	47.9	49.0
2.5	26.4	28.2	30.0	31.8	33.5	35.2	36.8	38.4	40.0	41.5	42.9	44.4	45.7	47.0	48.2	49.3
2.6	26.8	28.6	30.5	32.3	34.0	35.6	37.3	38.8	40.3	41.8	43.3	44.6	45.9	47.2	48.3	49.3
2.7	27.1	28.9	30.8	32.6	34.3	35.9	37.5	39.0	40.5	41.9	43.3	44.6	45.9	47.0	48.0	48.9
2.8	27.3	29.1	31.0	32.8	34.4	36.0	37.6	39.1	40.5	41.8	43.1	44.4	45.5	46.6	47.5	48.2
2.9	27.5	29.2	31.1	32.8	34.4	36.0	37.4	38.8	40.2	41.5	42.7	43.8	44.8	45.8	46.6	47.2
3.0	27.5	29.3	31.0	32.7	34.2	35.7	37.1	38.4	39.6	40.8	41.9	42.9	43.8	44.6	45.3	45.8

Estimates in the body of the table are accurate within ± 5 percent of model-estimated water savings.

Table 2. Planning Table for Estimating Water Savings in Service Areas with Different Household Characteristics - Multiple Family
(Gallons per Unit per Day)

Persons per Household	Toilets Per Household					
	1.0	1.1	1.2	1.3	1.4	1.5
1.5	30.7	33.0	35.0	36.7	38.1	39.2
1.6	31.8	34.2	36.3	38.0	39.5	40.6
1.7	32.9	35.4	37.5	39.4	40.9	42.1
1.8	34.0	36.6	38.8	40.7	42.3	43.5
1.9	35.1	37.8	40.1	42.0	43.6	44.9
2.0	36.2	38.9	41.3	43.3	45.0	46.3
2.1	37.4	40.1	42.5	44.6	46.3	47.6
2.2	38.5	41.3	43.8	45.9	47.6	49.0
2.3	39.6	42.5	45.0	47.2	49.0	50.3
2.4	40.7	43.6	46.2	48.5	50.3	51.7
2.5	41.8	44.8	47.4	49.7	51.6	53.0
2.6	42.8	45.9	48.7	51.0	52.8	54.3
2.7	43.9	47.1	49.9	52.2	54.1	55.6
2.8	45.0	48.2	51.0	53.4	55.4	56.8
2.9	46.1	49.4	52.2	54.6	56.6	58.1
3.0	47.2	50.5	53.4	55.9	57.8	59.3

Estimates in the body of the table are accurate within ± 5 percent of model-estimated water savings.

Reliability

The estimates given in Tables 1 and 2 represent the expected value of household savings in an entire service area--i.e., there is a fifty percent chance that the realized savings will exceed the estimate and a fifty percent chance that the realized savings will be less than the estimate. Suppose that a different kind of estimate is desired--one that can be met or exceeded 90 percent of the time. The second estimate incorporates the idea of reliability; sometimes 50/50 odds of being right or wrong are not good enough. The charter of many public utilities requires them to provide a public good in a reliable fashion. Also, the MOU on Water Conservation calls for the use of "estimates of reliable water savings" for water resource planning that incorporates urban water conservation achievements. If a water utility wants to incorporate estimates of the water saved through ULF toilet programs as a means of reliably meeting future water demand, then the water utility needs an estimate of water savings that incorporates the desired level of reliability.

The estimates in Tables 1 and 2 can be adjusted to reflect any desired level of reliability. We estimate a within-sample standard error surrounding the estimates in Tables 1 and 2 of about two and a half percent. A standard normal Z table can be used to translate the desired level of reliability into a Z-value--the number of standard errors away from the expected value that one must move to attain a higher level of reliability. A desired reliability of 90 percent, for example, implies that the expected value of household savings should be lowered about 1.28 standard errors. In our case, this translates into an estimate that is (1.28*2.5 percent =) 3.2 percent lower. In other words, there are sufficient data in this case so that this expression of "reliable savings" is quite close to the expected values shown in the tables. However, estimates of water savings likely to be achieved from other BMPs may be much less well defined and as a result may differ significantly from the expected values. In such cases, the concept of planning for reliable savings will assume qualitatively more importance.

III. ESTIMATING TOILETS REPLACED BECAUSE OF HOUSING TURNOVER

Existing non-ULF toilets can be replaced with ULF toilets for reasons other than a legislation that requires retrofit upon resale or exchange. For example, toilets break down, malfunction, and are usually replaced when households remodel their bathrooms. Given that the State of California is considering another separate piece of legislation that would ban the sale and installation of non-ULF toilets in the state, it is very likely that a large number of old toilets will be replaced with ULF toilets purely as a result of the normal toilet replacement cycle. If this is not taken into account, one will overstate the water-saving effectiveness of a legislation that requires retrofit upon resale or exchange. To account for these complexities, we estimate the water-saving effectiveness of retrofit upon sale or exchange legislation by calculating the water that will be saved if it were in place and the amount of water that would be saved anyway in the absence of such legislation. There are at least seven factors that can affect estimates of net water savings attributable to a legislation that requires ULF toilet retrofits upon resale or exchange.

- Housing demolition rate
- Housing turnover rate
- Natural toilet replacement rate
- Existing mix of toilets
- Type of new toilet used for replacement
- Average number of people and toilets per household
- Changes in household size over time

Of these seven factors, changes in average household size over time can be safely ignored because it is unlikely to change appreciably over a period of ten years which is the focus of this analysis. Information about the average number of people and toilets per household, and the existing mix of pre-1980 and post-1980 toilets are required to forecast per-retrofit water savings--this was discussed in detail in Section II.

For the remaining factors--that is, the housing demolition rate, the housing turnover rate, the natural toilet replacement rate, and type of new toilet used for replacement--water planners should use data that is relevant to their own service area. Although some amount of uncertainty naturally surrounds estimates of the above factors, it is largest in the case of the natural toilet replacement rate and the type of new toilet that is likely to be used for replacement. To assess the extent to which this uncertainty affects estimates of the water-saving potential of BMP 14 ~~16~~, we performed detailed sensitivity analyses. A total of six scenarios were considered for the sensitivity analysis.

It is generally agreed that, on average, a toilet lasts anywhere from 20 to 30 years, although some claim to have seen toilets as old as 50-60 years. Assuming that toilets are replaced at an annual rate of 3 percent implies that after 30 years approximately 40 percent $[(1-0.03)^{30}]$ of toilets of this vintage would still be around; with a replacement rate of 7 percent this number declines to 11 percent $[(1-0.07)^{30}]$ which can be considered the other end of the range. We performed sensitivity analyses assuming the natural toilet replacement rate is 3 percent, 5 percent and 7 percent. The sensitivity analyses also considered two additional scenarios corresponding to each natural toilet replacement rate that pertain to the type of toilets that are likely to be used to replace old malfunctioning toilets. In the first scenario we assume that all toilets that are naturally replaced are retrofitted with 1.6 gallon ULF toilets. This is a very likely scenario given that legislation banning the sale and installation of non-ULF toilets is being considered in the state of California ~~(BMP 2B)~~. In the other scenario, we assumed that 50 percent of toilets naturally replaced are retrofitted with ULF toilets in the base year and that this proportion increases to 100 percent by the end of the 10-year analysis period. We found that the results were relatively insensitive to these assumptions. The 10-year cumulative water savings derived from these six scenarios were within "15 percent of the average.

The ULFT subcommittee proposes that service areas use a natural toilet replacement rate of 4 percent and assume that all toilets naturally replaced will be retrofitted with 1.6 gallon/flush ULF toilets for their area-specific calculations. The next section describes illustrative calculations performed for a hypothetical service area.

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IV. SAMPLE CALCULATION FOR A HYPOTHETICAL SERVICE AREA

In this section, we present detailed calculations for a hypothetical service area to demonstrate the method of calculating conservation targets. Single family and multiple family homes are analyzed separately. This scenario is based on a natural rate of toilet changeout of 4 percent per year, and that all new retrofits are of the 1.6 gallon-per-flush variety.

Table 3 shows the data used for this sample calculation. For example, in this service area, publicly available data on real-estate sales suggest that 30 percent of all single family homes and 42 percent of all multiple family complexes were sold at least once in the last five years. This is typically the format in which real-estate transactions data are available. This five-year estimate can be transformed into an annual turnover rate using the following formula:

$$(1 - P)^5 = (1 - S)$$

Where S is the proportion of the stock that was sold at least once during the five year period and P is the annual turnover rate. We apply a different turnover rates for the single family and the multiple family housing stock.

Table 3 Data Used in Sample Calculation

Parameter	Single Family	Multiple Family
Annual housing demolition rate	0.5%	0.5%
Annual housing turnover rate	6.9%	10.3%
Annual toilet replacement rate	4.0%	4.0%
No. of homes with old pre-1980 toilets	700,000	420,000
No. of homes with 3.5 gal. (post-1980) toilets	250,000	210,000
No. of homes with 1.6 gal. toilets	50,000	70,000
Average persons per household	3.25	2.47
Average toilets per household	2.16	1.20

NOTE: Homes already with 1.6 gallon/flush toilets are excluded from the analysis.

After establishing the home turnover rate, the next step is to estimate average water savings per household per day using information contained in Section II. For single family households (Table 1), average household water savings corresponding to 3.25 people per household (refer footnote 1) and 2.16 toilets per household is approximately 43.4 gallons per day. As mentioned earlier, estimated water savings represent a weighted mix of pre-1980 and post-1980 (3.5 gl./fl.) toilets. To illustrate how to adjust these estimates for a specific service area, use the relations listed in Section II to incorporate the service area specific data in Table 3. From Equation (1) for single family homes, pre-1980 toilet retrofits are estimated to save approximately 44 gallons/day and post-1980 toilets are estimated to save 35.2 gallons/day. For a 90 level of reliability, these estimates are lowered 3.2 percent to 42.6 gallons/day and 34.1 gallons per day. The similar calculation for multiple family complexes uses Table 2 and Equation (2), savings pre-1980 toilet retrofits are estimated to save approximately 48.2 gallons/day and post-1980 toilets are estimated to save 38.6 gallons/day. Changing this expected value to a 90 percent reliable value gives 46.7 gallons per day and 37.4 gallons per day.

We first calculate water savings assuming no retrofit-upon-resale legislation is in effect and that all savings result from the normal cycle of toilet replacements (Tables 4 and 6). These results can be interpreted as savings that would result from a legislation that bans the sale and installation of non-ULF toilets in the State of California. Next we estimate water savings that result from the combined effect of natural changeout combined with a retrofit-upon-resale-or-exchange legislation (Tables 5 and 7). The difference between the two then is the net water-saving effect of a legislation that requires replacement of non-ULF toilets with ULF toilets at the time of resale or exchange (BMP 14).

Table 8 shows these estimates of net water conservation (or conservation targets) that the particular service area in question will have to achieve over the course of the next 10 years. For example, in 1993 the total target is (2822 single family net + 3026 multiple family net =) 5848 acre feet. In the next year, additional conservation of (2412 single family net + 2487 multiple family net =) 4899 acre feet is added to the previous year's target for a total cumulative savings target of (5848 AF + 4899 AF =) 10747 acre-feet. Figures 1 through 3 plot the cumulative savings targets for BMP 14 over the course of 10 years. Note that the conservation targets implied by BMP 14 (Figure 3) has a curved shape. This is a complete result of the assumed ULF retrofits--in the later years, more and more of the homes that are sold have already been retrofitted with ULF toilets.

Note that the conservation targets are listed in acre-feet per year not toilets per year. To meet the water conservation targets, that amount of water specified in Table 8 must conserved through ULF efforts. Since multiple family retrofits save more than single family retrofits and the first toilet retrofit per household saves more than the second or third retrofits, it is possible to design ULF conservation programs that conserve the same amount of water using fewer toilets. Thus, issues of program design are intimately linked with the effort and costs that will have to be incurred to meet these conservation targets.

Table 4 Single Family Natural Replacement Only

Year	Housing Stock	Homes Naturally Retrofitted	Toilets Naturally Retrofitted	Annual Water Savings (AF/yr)	Annual Cumulative Savings (AF/yr)
1992	950,000	0	0	0	0
1993	912,190	37,810	81,670	1,709	1,709
1994	875,885	36,305	78,419	1,641	3,350
1995	841,025	34,860	75,298	1,576	4,926
1996	807,552	33,473	72,301	1,513	6,439
1997	775,411	32,141	69,424	1,453	7,891
1998	744,550	30,861	66,661	1,395	9,286
1999	714,917	29,633	64,007	1,339	10,626
2000	666,483	28,454	61,460	1,286	11,912
2001	659,142	27,321	59,014	1,235	13,147
2002	632,908	26,234	56,665	1,186	14,333

Note: Water savings are from a weighted mix of pre-1980 and post-1980 toilets.

Table 5. Single Family: Natural Replacement and Housing Turnover

Year	Housing Stock	Homes Naturally Retrofitted	Home Turnover	Total Homes Retrofitted	Total Toilets Retrofitted	Annual Water Savings (AF/yr)	Annual Cumulative Savings (AF/yr)
1992	950,000	0	0	0	0	0	0
1993	849,758	37,810	62,432	100,242	216,522	4.531	4,531
1994	760,094	33,820	55,844	89,665	193,675	4,053	8,584
1995	679,890	30,252	49,952	80,203	173,239	3,625	12,209
1996	608,150	27,060	44,681	71,740	154,959	3,243	15,452
1997	543,979	24,204	39,966	64,171	138,608	2,901	18,352
1998	486,580	21,650	35,749	57,399	123,983	2,594	20,947
1999	435,237	19,366	31,977	51,343	110,900	2,321	23,267
2000	389,312	17,322	28,603	45,925	99,198	2,076	25,343
2001	348,232	15,495	25,585	41,079	88,731	1,857	27,200
2002	311,488	13,860	22,885	36,745	79,369	1,661	28,861

Table 6 Multiple Family: Natural Replacement Only

Year	Housing Stock	Homes Naturally Retrofitted	Toilets Naturally Retrofit	Annual Water Savings (AF/yr)	Annual Cumulative Savings
1992	630000	0	0	0	0
1993	604926	25074	30089	1224	1224
1994	580850	24076	28891	1175	2369
1995	557732	23118	27741	1129	3528
1996	535534	22198	26637	1064	4611
1997	514220	21314	25577	1040	5652
1998	493754	20466	24559	999	6651
1999	474103	19651	23582	959	7610
2000	455233	18869	22643	921	8531
2001	437115	18118	21742	884	9416
2002	419718	17397	20877	849	10265

Table 7 Multiple Family: Natural Replacement and Housing Turnover

Year	Housing Stock	Homes Naturally Retrofitted	Home Turnover	Total Home Retrofitted	Total Toilets Retrofitted	Annual Water Savings (AF/yr)	Annual Cumulative Savings (AF/yr)
1992	630000	0	0	0	0	0	0
1993	542943	25074	61983	87057	104468	4250	4250
1994	467916	21609	53418	75027	90032	3663	7912
1995	403257	18623	46036	64659	77591	3156	11069
1996	347533	16050	39675	55724	66869	2720	13789
1997	299509	13832	34192	48024	57629	2344	16133
1998	258121	11920	29467	41388	49665	2020	18154
1999	258121	10273	25395	35669	42802	1741	19895
2000	222452	8854	21886	30740	36888	1501	21395
2001	165221	7630	18862	26492	31790	1293	22689
2002	142390	6576	16255	22831	27397	1115	23803

Table 8. Conservation Targets (AF/yr): Net Conservation for Single and Multiple Family

	Single Family Savings			Multiple Family Savings			Total Annual Savings			Annual Cumulative Savings		
Year	Natural	Natural + Turnover	Net Savings	Natural	Natural + Turnover	Net Savings	Natural	Natural + Turnover	Net Savings	Natural	Natural + Turnover	Net Savings
1992	-	-	-	-	-	-	-	-	-	-	-	-
1993	1,709	4,531	2,822	1,224	4,250	3,026	2,833	8,781	5,948	2,833	8,781	5,948
1994	1,641	4,053	2,412	1,175	4,663	3,488	2,816	7,715	4,899	5,649	16,496	10,847
1995	1,578	3,625	2,047	1,129	3,153	2,024	2,704	6,782	4,078	8,353	23,278	14,925
1996	1,513	3,243	1,730	1,064	2,720	1,656	2,597	5,963	3,366	10,950	29,241	18,291
1997	1,453	2,901	1,448	1,040	2,344	1,304	2,493	5,245	2,752	13,443	34,486	21,043
1998	1,395	2,594	1,199	999	2,020	1,021	2,394	4,615	2,221	15,837	39,101	23,264
1999	1,339	2,321	982	959	1,741	782	2,299	4,082	1,783	18,136	43,183	25,047
2000	1,286	2,076	790	921	1,501	580	2,207	3,578	1,371	20,343	46,761	26,418
2001	1,235	1,857	622	884	1,283	399	2,119	3,150	1,031	22,462	49,911	27,449
2002	1,186	1,661	475	849	1,115	266	2,035	2,775	740	24,497	52,686	28,189

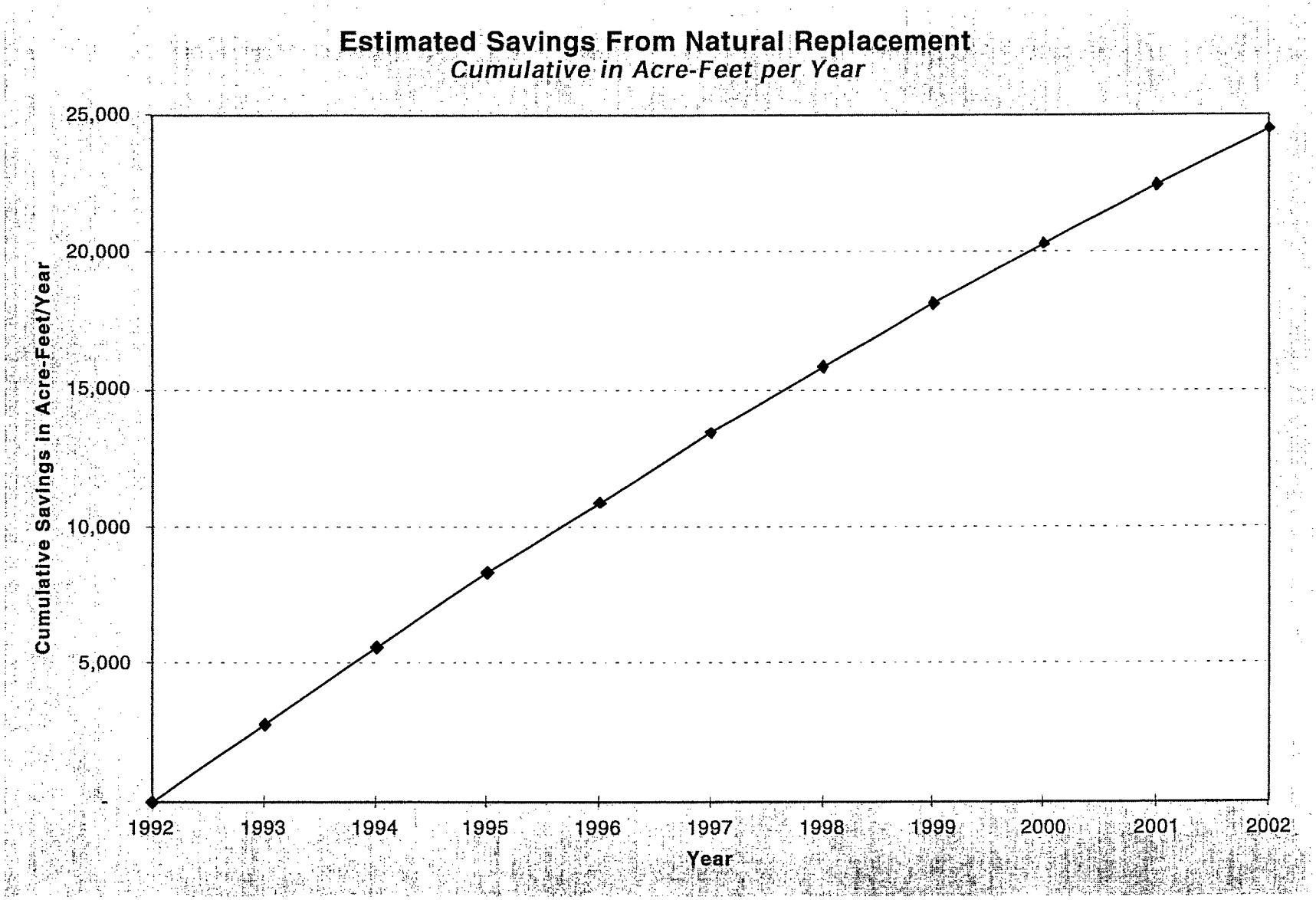

Figure 1. Estimated savings from natural replacement only

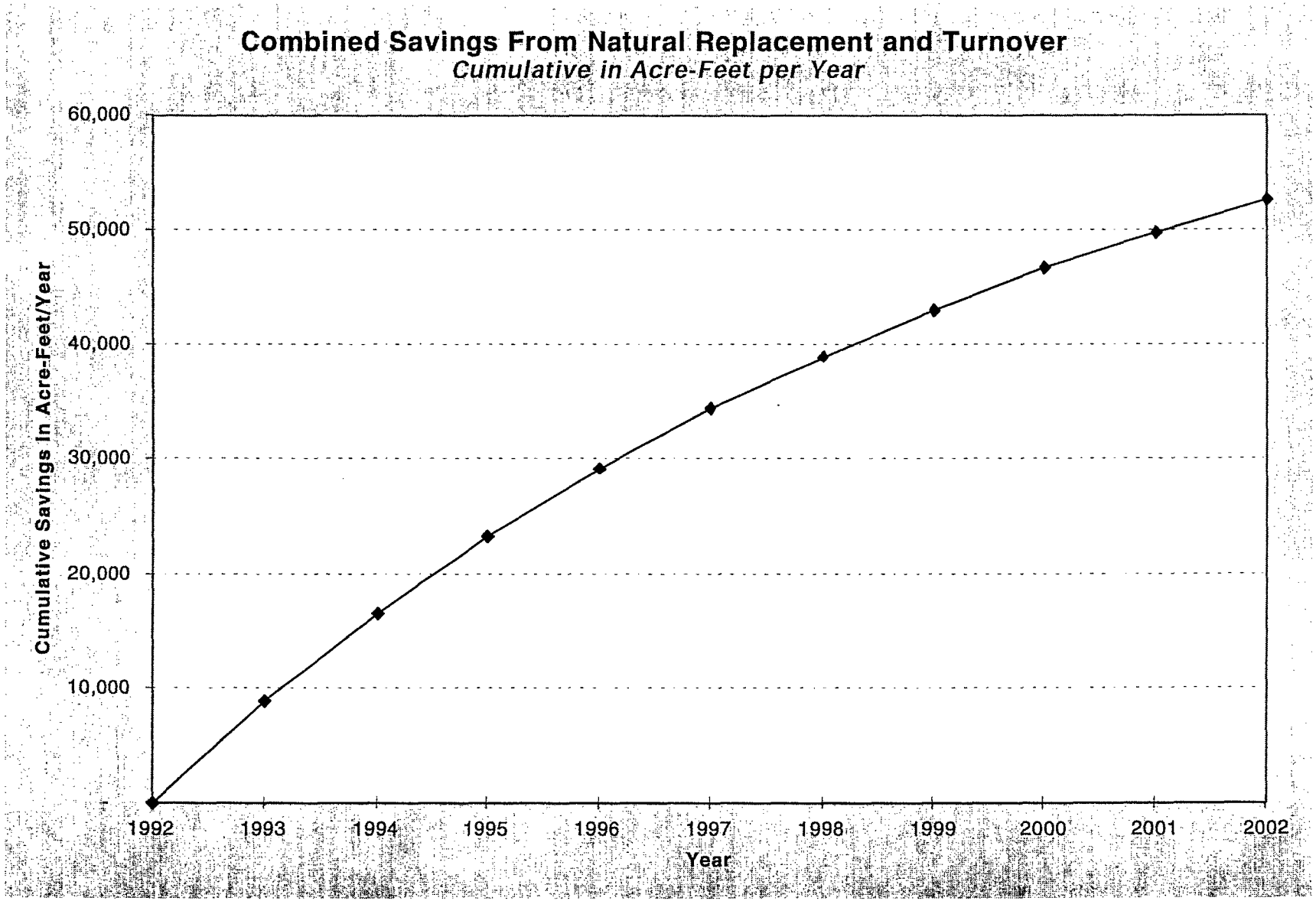

Figure 2. Estimated combined savings from natural replacement and housing turnover.

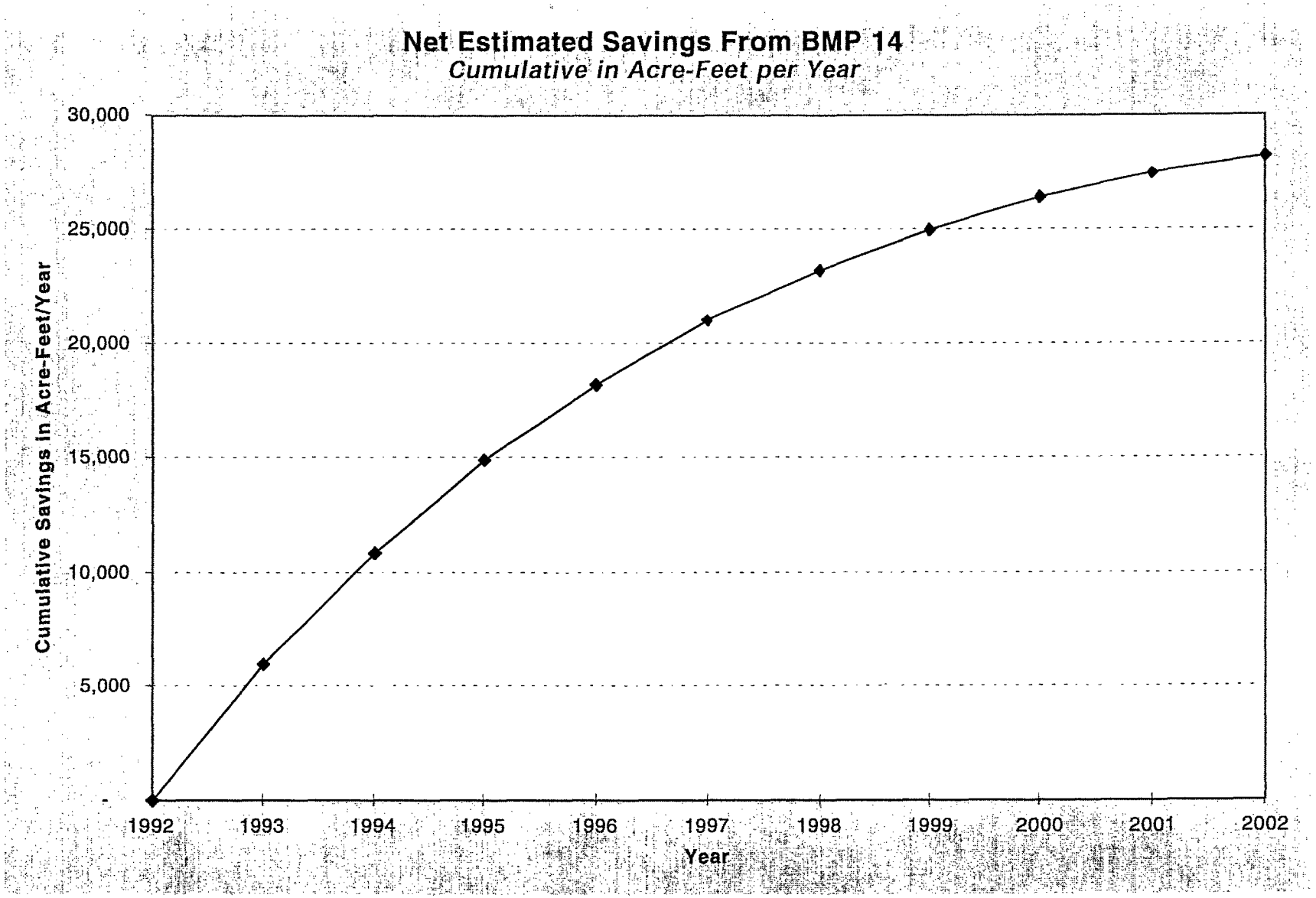

Figure 3. Net estimated savings from housing turnover only (BMP 14)

V. ESTIMATING WATER SAVINGS FROM NEW CONSTRUCTION The analysis described above can be extended to evaluate water savings that will be achieved from new construction. For this analysis each service area will be required to forecast the rate of growth of new construction by type (single family, multiple family, and so on). The water savings calculations would be based on installation of 1.6 ULF toilets, assuming the implementation of the 1991 plumbing code, as opposed to installation of 3.5 gallon/flush toilets.

Appendix A. Overview of the ULF Toilet Rebate Evaluation Reports

There are several reports that document the ULF toilet rebate evaluation in Los Angeles and Santa Monica. Each has a different focus and different intended audience.

Ultra Low Flush Toilet Rebate Programs in Southern California: Lessons For Water Managers and Planners. This is an overview report that presents the key findings from Los Angeles and Santa Monica related to ULF program design, justification, and evaluation.

The Conserving Effect of Ultra Low Flush Toilet Rebate Programs. This report contains the summary of findings about how much water was saved by the Los Angeles and Santa Monica ULF toilet rebate programs. This study requires no technical background and presents the evaluation and its findings in plain English.

Continuous-Time Error Components Models of Residential Water Demand. This technical report documents the formal structure of the models of household water demand used in the evaluation of the Los Angeles and Santa Monica ULF toilet rebate programs. This study should be of interest to a technical audience concerned with statistical and analytic issues involved in estimating household water demand models from billing system data.

Mapping the Conserving Effect of Ultra Low Flush Toilets: Implications for Planning. This technical report presents an empirical approach to quantifying the conservation potential of ULF toilet retrofits. The analysis presented in this report can be used to provide quantitative answers to such questions as how much water would be saved by differently designed programs, or how much water ULF retrofit programs would save in other service areas. This study should be of interest to water planners and program managers interested in estimating the conservation potential of ULF retrofit programs in other service areas.

Data Used in the Evaluation of the Los Angeles and Santa Monica Ultra Low Flush Toilet Rebate Programs. This backup report presents the inspection and telephone survey instruments that were used to collect the data, as also the tabulations of responses.

EXHIBIT 7. BYLAWS OF THE CUWCC

Adopted December 7, 1994
Amended April 8, 1998
Amended December 9, 1998

BYLAWS
OF
CALIFORNIA URBAN WATER CONSERVATION COUNCIL

ARTICLE I

Name, Principal Office, Purpose and Restrictions

1.01 Name The name of the corporation is California Urban Water Conservation Council, a California nonprofit public benefit corporation (Council).

1.02 Principal Office The Board of Directors (Board) shall determine the location of the principal office of the corporation.

1.03 Purpose The purpose of the Council is to implement the Memorandum of Understanding Regarding Urban Water Conservation in California dated September 1991, as amended from time to time, among signatories comprised of water suppliers, public advocacy organizations and other interested groups (the MOU).

1.04 Restrictions All policies and activities of the Council shall be consistent with and limited by the MOU and shall also be consistent with: (a) Applicable federal, state and local antitrust and trade regulation laws; (b) Applicable tax-exemption requirements including that no part of the Council's net earnings inure to the benefit of any private individual; and (c) All other legal requirements including the California Nonprofit Corporation Law under which the Council is incorporated and to which its operations are subject, as amended from time to time.

ARTICLE II

MOU Signatory Groups

2.01 MOU Signatory Groups. All participants in the Council must be signatories to MOU. Eligible signatories are: (1) water suppliers, (2) public advocacy organizations, and (3) other interested groups, as defined below.

2.02 Water Supplier Group. This group ("Group 1") consists of water suppliers, defined as any entity, including a city, which delivers or supplies water for urban use at the wholesale or retail level.

2.03 Public Advocacy Organization Group. This group ("Group 2") consists of public advocacy organizations. A public advocacy organization is defined as a nonprofit organization whose primary mission

is protection of the environment, or who has a clear interest in advancing the Best Management Practice, and whose primary function is not the representation of trade, industrial or utility entities.

2.04 **Other Interested Group.** This group ("Group 3") includes other organizations with an interest in the purposes of the Council which are not included in Group 1 or Group 2.

2.05 **Representatives.** Each MOU signatory shall designate one representative to the Council. The signatory shall be responsible for informing the Council of the identity of its representative at all appropriate times. Signatories may also name substitute representatives to attend meetings in place of the designated representative. Substitute representatives have the same voting rights as the designated representative, but may not take the place of an officer of the Council. Only one representative from any signatory may vote within the Board, the Executive Committee or any other Council committee at any time. Designated and substitute representatives may be referred to collectively as "representatives".

2.06 **Membership** This corporation shall have no members.

ARTICLE III

Fees

3.01 **Fees** The Board of Directors may recommend fees and assessments and set the terms of payment, which will be voluntary to the signatories.

ARTICLE IV

Board of Directors

4.01 **Board of Directors** The Board of Directors is the governing body of the Council and has authority and responsibility for the supervision, control, and direction of the Council. A meeting of the full Board may be referred to as a "Plenary session" or "Plenary meeting".

4.02 **Composition.** The Board shall consist of the representatives of Group 1 and Group 2 signatories. Representatives of Group 3 signatories shall be advisory directors. Advisory directors may attend and participate in meetings, but do not have a vote.

4.03 **Term of Office.** All representatives will serve until replaced by the signatory they represent.

4.04 **Meetings.** The President, the Vice-president, the Secretary or 10 percent or more of the directors of each of Group 1 and Group 2 may call meetings of the Board. The Board shall hold its ~~annual~~ quarterly meeting(s) at the time and place it selects and may hold other regular meetings each year at the time and place it selects.

4.05 **Notice.** The Board may hold regular meetings without additional notice if the time and place of such meetings has been fixed by the Board and communicated to all Board members. The Board may hold special meetings upon seven days notice by first class mail or 48 hours notice delivered personally or by telephone or electronic media.

4.06 **Quorum.** A quorum of the Board shall be at least 30 representatives with voting rights , provided that at least 10 percent of the directors from each of Group 1 and Group 2 are present.

4.07 **Board Action.** Any decision by the Board to undertake responsibilities in addition to those listed in Exhibit 2, Section 3, of the MOU; to modify the MOU itself; or to modify Exhibits 2 or 3 of the MOU must be carried out according to the procedures in Exhibit 2, Section 7, of the MOU. All other Board actions, including modification of MOU Exhibits other than Exhibits 2 or 3 and modification of the Bylaws, require that a quorum be present at a properly noticed meeting of the Board, that a majority of the directors voting from Group 1 vote in favor of the action, and that a majority of the directors voting from Group 2 vote in favor of the action. The Board may modify the Bylaws and take other actions only to the extent that such actions are consistent with the then current version of the MOU.

ARTICLE V

Executive Committee

5.01 **Executive Committee.** The Board may delegate any of its authorities to an Executive Committee, provided the Committee shall report its actions to the Board at its next meeting. The Executive Committee may be referred to as the "Steering Committee".

5.02 **Composition, Selection and Term** The Executive Committee shall consist of voting and non-voting signatory members as follows: Board members representing Group 1 signatories shall select from among themselves up to eight signatories, whose representatives shall serve as voting members of the Executive Committee. Board members representing Group 2 signatories shall select from among themselves up to eight signatories, whose representatives shall serve as voting members of the Executive Committee. Advisory Board members representing Group 3 signatories shall select from among themselves up to four signatories, whose representatives shall serve as non-voting members of the Executive Committee. In addition, all officers of the Council are members of the Executive Committee and have the same voting rights on the Committee as other representatives of their respective Groups. The outgoing President shall be a non-voting member of the Executive Committee for the following term. The numbers of members of the Executive Committee shall be increased by the number of officers, except when one or more officers have been independently selected as members of the Executive Committee. Executive Committee members shall be selected at the last Board meeting of the calendar year and shall assume office starting January 1 of the following year for a term of two years. The terms will be staggered with half of the positions of each group being elected each year. Unlimited consecutive terms may be served.

Group 1 and 2 Board members shall nominate from among themselves candidates for the Executive Committee in person or in writing at the third Plenary of the year prior to the start of a new two-year term. Write-in nominations must be received by the Council prior to the start of the Plenary session. Any nomination must be seconded by a Board member in person or in writing, and accepted by the nominee in person or in writing to be included on the ballot.

The ballot of Group 1 and 2 candidates for the Executive Committee shall be included in the Plenary Packet of the final Plenary of the year prior to the start of a new two-year term. The Board shall vote on the ballot at the final Plenary of each year. Votes may be made in person or in writing. Write-in votes must be received prior to the start of the Plenary session to be counted. Group 1 and 2 Board members may vote for up to eight candidates from their respective Groups.

The top eight candidates from Group 1 and the top eight candidates from Group 2, as ranked by number of votes received, shall be elected to the Executive Committee. If either Group 1 or Group 2 nominates less than eight candidates, all candidates from that Group shall be elected to the Executive Committee.

5.03 **Vacancy.** If a vacancy occurs on the Executive Committee for any reason, the remaining members of the affected Group will select a replacement for the un-expired term, subject to approval by the Executive Committee.

5.04 **Number of Meetings.** The President of the Council, and any other persons designated by the Executive Committee, may call meetings of the Executive Committee.

5.05 **Notice** The Executive Committee may hold regular meetings without additional notice if the time and place of such meetings has been fixed by the Executive Committee and communicated to all members of the Executive Committee. The Executive Committee may hold special meetings upon seven days notice by first class mail or 48 hours notice delivered personally or by telephone or electronic media.

5.06 **Quorum.** A quorum of the Executive Committee shall be at least 50% of the total number of Group 1 and Group 2 Executive Committee members, provided that at least 2 members are present from each of Group 1 and Group 2.

5.07 **Committee Action.** All Executive committee actions require that a quorum be present, that a majority of the Executive Committee members voting from Group 1 vote in favor of the action, and that a majority of the Executive Committee Members voting from Group 2 vote in favor of the action. The Executive Committee may also act without meeting, provided that (1) the taking of the vote has previously been authorized by the Executive Committee; (2) the vote has received seven days notice by first class mail or 48 hours notice delivered personally or by telephone or electronic media; and (3) the proposed action is approved by 50% or more of the Group 1 and 50% or more of the Group 2 members of the Executive Committee voting. The Executive Committee may take action without seeking Board approval only where the Board has delegated such authority to the Executive Committee and only to the extent that the action is consistent with the then current version of the MOU.

ARTICLE VI

Officers

6.01 **Officers.** The officers of the Council are President, Vice-President, Secretary and Treasurer. The President and Vice-President may be referred to as Convener and Vice-Convener, respectively.

6.02 **Qualifications.** Only designated representatives of signatories may serve as officers. In addition, the offices of President and Vice President may only be held by directors representing Group 1 or Group 2 signatories. No person may hold more than one office at the same time, except that one person may hold the offices of Secretary and Treasurer concurrently.

6.03 **Selection and Term of Office.** The officers shall be selected at the last Board meeting of the calendar year and assume office starting January 1 of the following year for a term of one year. The offices

of President and Vice-President shall not be held by designees from the same Group. The office of President shall alternate between Group 1 and Group 2. The Board may specify that the Secretary and/or Treasurer will be members of Group 3. If so, then Group 3 will select these officers, subject to approval by the Board.

The Board shall nominate candidates for the offices of President, Vice-President, Secretary, and Treasurer in person or in writing at the third Plenary of each year not less than 60 days prior to the Plenary during which the nominations are voted upon. Written nominations must be received by the Council prior to the start of the Plenary session. Any nomination must be seconded by a Board member in person or in writing, and accepted by the nominee in person or in writing to be included on the ballot. For the offices of President and Vice-President, Group 1 and 2 Board members may only nominate candidates for the office their Group will hold in the coming term.

The ballot for the offices of President, Vice-President, Secretary, and Treasurer shall be included in the Plenary Packet of the final Plenary of each year. The Board shall vote on the ballot at the final Plenary of each year. Votes may be made in person or in writing. Write-in votes must be received prior to the start of the Plenary session to be counted. For the offices of President and Vice-President, Group 1 and 2 Board members may only vote for candidates for the office their Group will hold in the coming term.

For each office, the candidate receiving the most votes will be awarded the office.

6.04 **Duties.** The officers perform those duties that are usual to their positions and that are assigned to them by the Board, including those duties that are set forth in the position descriptions for each officer as adopted by the Board from time to time. In addition, the President of the Council acts as Chair of the Board and the Executive Committee; the Vice-President acts in place of the President when the President is not available; and the Treasurer is the chief financial officer of the Council.

6.05 **Vacancies.** If a vacancy occurs among the officers, for any reason, the Executive Committee shall elect another designee from the same Group for the unexpired portion of the term. Signatories whose designee serves as an officer may not substitute another individual into that office.

ARTICLE VII

Executive Director

7.01 The Board of Directors may hire an Executive Director to perform such duties and be granted such powers as described and agreed upon by the Board. The Board may authorize the Executive Director to hire other such staff as may be necessary to perform business and management functions of the Council. The Executive Director serves at the pleasure of the Executive Committee. The Executive Director has sole responsibility for management, control and retention of other staff.

ARTICLE VIII

Indemnification and Insurance

8.01 **Indemnification** To the fullest reasonable extent permitted by the law, the Council shall indemnify and hold harmless any agents subjected to a claim by reason of any alleged or actual action or inaction in the performance of their duties performed in good faith on behalf of the Council. "Agent" for this purpose shall include Directors, officers and employees.

8.02 **Insurance.** The Council shall have the right and shall purchase and maintain insurance on behalf of its agents against any liability asserted against or incurred by the agent in such capacity arising out of the agent's status as such.

ARTICLE IX

Policies, Rules, Interpretation

9.01 **Policies and Rules.** The Board may establish policies, procedures and rules that are consistent with these Bylaws for the governance of the Council and its programs.

9.02 **Interpretation.** These Bylaws should be interpreted consistent with the California Nonprofit Corporation Law and must be interpreted so as to conform with that Law, as it is interpreted and amended from time to time. In cases of conflict between these Bylaws and the MOU, the language of the MOU shall prevail.

ARTICLE X

Nondiscrimination

10.01 **Nondiscrimination.** The corporation shall ensure equal employment opportunity for all persons, regardless of race, color, religion, sex, national origin, age, physical condition or disability, or other conditions within the limits imposed by law. These principles shall apply to all employment practices, to selection of consultants, contractors, and suppliers, and to all other applicable business practices of the corporation.

ARTICLE XI

Adoption of Bylaws

11.01 The Bylaws may be adopted, provided that: (1) a quorum of the signatories, as defined in Section 4.06 of the Bylaws, is present at a meeting noticed according to the requirements of Section 4.05 of the Bylaws; (2) a majority of the directors voting from Group 1 vote in favor of adoption; and (3) a majority of the directors voting from Group 2 vote in favor of the adoption. These Bylaws were adopted by the California Urban Water Conservation Council on December 7, 1994 and were last amended on December 9, 1998.